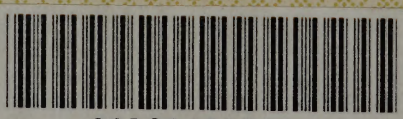
84


22102491521

Presented to the Library
by
The New York State
Medical Asso

TRANSACTIONS

OF THE

NEW YORK STATE MEDICAL ASSOCIATION.

COMMITTEE ON PUBLICATIONS.

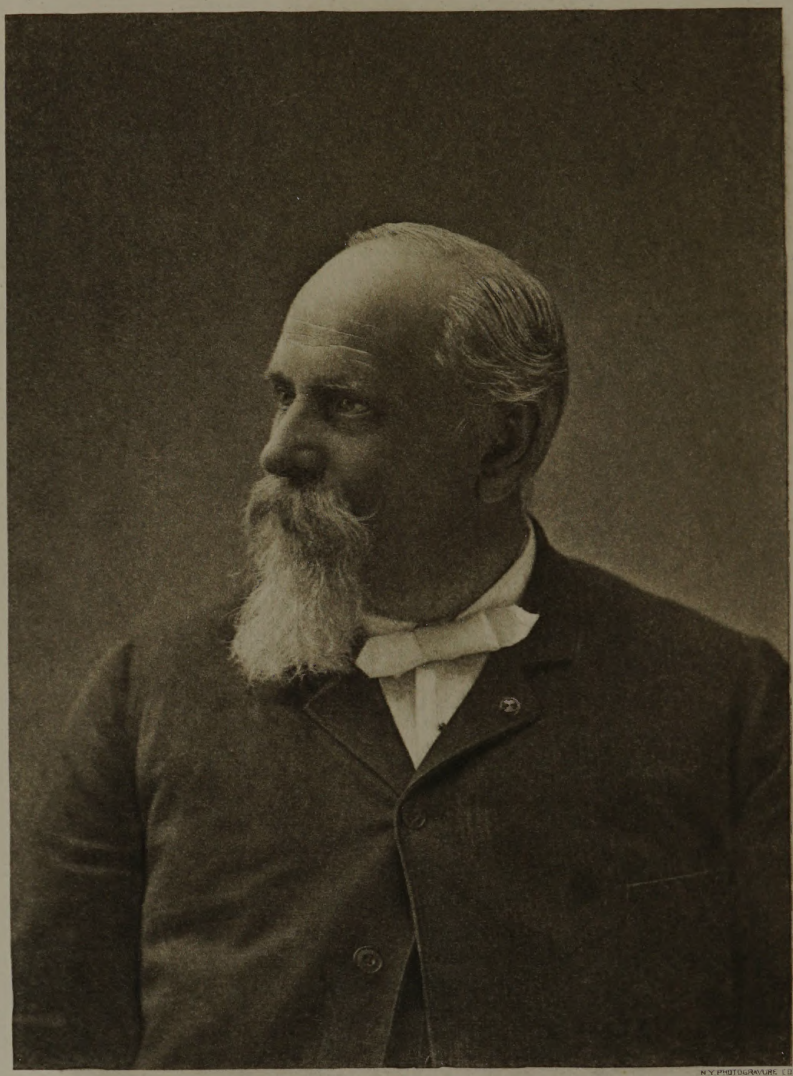
E. D. FERGUSON, M. D., of Rensselaer County, CHAIRMAN AND EDITOR OF THE TRANSACTIONS.

A. T. VAN VRANKEN, M. D., of Albany County.

THOMAS WILSON, M. D., of Columbia County.

PRINTED BY
REPUBLICAN PRESS ASSOCIATION,
CONCORD, N. H.

BRITISH MEDICAL
Library
ASSOCIATION



N.Y. PHOTOGRAVURE CO.

J. B. Andrews

TRANSACTIONS

OF

THE NEW YORK STATE MEDICAL ASSOCIATION,

FOR THE YEAR 1894,

VOLUME XI.

EDITED FOR THE ASSOCIATION

By E. D. FERGUSON, M. D.,

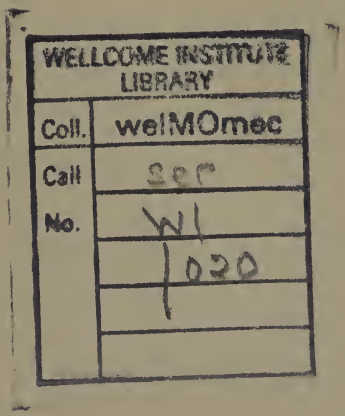
OF RENSSELAER COUNTY.

PUBLISHED BY THE ASSOCIATION:

64 Madison Avenue,

NEW YORK CITY.

COPYRIGHT, 1895.
BY THE NEW YORK STATE MEDICAL ASSOCIATION.



CONTENTS.

PAGE.

Officers and Council for 1893–'94 1
Committee of Arrangements for 1893–'94 2
Officers and Council for 1894–'95 3
Officers of the Branch Associations for 1895 5
List of Presidents and Vice-Presidents 9
List of Fellows registered at Eleventh Annual Meeting 13
List of Delegates and Invited Guests at Eleventh Annual Meeting . 17
Address of Welcome and Report of Committee of Arrangements. By Charles E. Denison, M. D., of New York County . . . 19
The President's Address. By Thomas D. Strong, M. D., of Chautauqua County 21
A Case of Lateral Lithotomy for Removal of a Wire Nail, Alleged to have been in the Bladder Four Years. By Zera J. Lusk, M. D., of Wyoming County 27
Report of a Case of Traumatic Epilepsy: Recovery. By Zera J. Lusk, M. D., of Wyoming County 29
A New Non-conducting Speculum, for Use in Post-partum and Post-abortum Intra-uterine Douching. By Eden V. Delphey, M. D., of New York County 35
Some Interesting Cases of Appendicitis. By Joseph D. Bryant, M. D., of New York County 37
Interesting Cases from General Practice, Illustrating Special Points of Treatment. By Charles E. Lockwood, M. D., of New York County 50
A Case of Anaesthesia with Death, and Attempted Extortion Successfully Resisted. By Eden V. Delphey, M. D., of New York County 65
Typhlenteritis versus Appendicitis. By John W. S. Gouley, M. D., of New York County 78
The Necessity of International Sanitary Regulations Governing the Migration of Large Bodies of People. By Stephen Smith, M. D., of New York County 84
The Technique of Caesarian Section. By A. Palmer Dudley, M. D., of New York County 106

Hysterectomy for Uterine Fibroma by Baer's Method, with Report of Nine Successful Cases. By Joseph Taber Johnson, M. D., of Washington, D. C. 116
Hysterectomy in Pus Cases. By William R. Pryor, M. D., of New York County 123
The Surgical Treatment of Inguinal Hernia. By Henry O. Marcy, M. D., of Boston, Mass. 140
The Differential Diagnosis of Traumatic Intracranial Lesions. By Charles Phelps, M. D., of New York County 159
Fractures of the Inferior Extremity of the Humerus, Involving the Articulating Surface, with Report of Two Cases Occurring in Children. By Douglas Ayers, M. D., of Montgomery County 282
The Stearate of Zinc Compounds in Atrophic Rhinitis. By Joseph S. Gibbs, M. D., of Philadelphia, Pa. 290
Fatal Suppurative Cellulitis following an Injury to the Hand. By William H. Robb, M. D., of Montgomery County 300
Diet and Regimen for Diminution of Fat. By T. J. McGillicuddy, M. D., of New York County 308
Discussion on the Prevention of Tuberculosis. By Hermann M. Biggs, M. D., of New York County 314
By E. K. Dunham, M. D., of New York County 330
By E. G. Janeway, M. D., of New York County 334
Some Recent Studies on the Communicability and Treatment of Diphtheria and Pseudo-diphtheria. By Wm. Hallock Park, M. D., of New York County 340
Diphtheria. By John Cronyn, M. D., of Erie County 355
The Diagnosis and Treatment of Pleurisy. By J. Blake White, M. D., of New York County 364
The Treatment of Retinitis Albuminurica in Pregnancy from an Ethical Standpoint. By Frank Van Vleet, M. D., of New York County 380
Address: The Genesis of Discovery. By John Shrady, M. D., of New York County 395
Reminiscences of a Country Doctor During the Past Fifty Years, including the Crude Condition of American Medical Literature at the Beginning of That Period. By Darwin Colvin, M. D., of Wayne County 403
A Practical Study of Serious Abdominal Contusions, with a Clinical Report of Twenty-one Cases. By Thomas H. Manley, M. D., of New York County 426
A Few Remarks on the Treatment of Typhoid Fever. By J. G. Truax, M. D., of New York County 497

Intestinal Anastomosis, with Report of a Case. By Frederick Holme Wiggin, M. D., of New York County 503
The Arthropathies of Locomotor Ataxia. By Parker Syms, M. D., of New York County 524
A Case of Ectopic Pregnancy at the Utero-tubal Junction. By E. D. Ferguson, M. D., of Rensselaer County 533
The Early Diagnosis of Tubal Pregnancy and "Primary Laparotomy" in such Cases. By J. E. Janvrin, M. D., of New York County 537
Immediate Restoration of Function of Lung and Pleura and Permanent Recovery after Thoracentesis. Charles A. Leale, M. D., of New York County 544
Uretero-intestinal Fistula, as a Result of Abdominal Abcess, not due to Appendicitis, with Recovery. By A. T. Van Vranken, M. D., of Albany County 553
What is Fever, and How is It Best Managed? By Henry F. Risch, M. D., of Kings County 557
Tetanus Neonatorum. By J. Lewis Smith, M. D., of New York County 566
Brief Comments on the Materia Medica, Pharmacy, and Therapeutics of the Year Ending October 1, 1894. By E. H. Squibb, M. D., of Kings County 577
Memoir of Judson Boardman Andrews, M. D. By William D. Granger, M. D., of Westchester County 646
Memoir of M. K. Hogan, M. D. By William O'Meagher, M. D., of New York County 654
Memoir of William Govan, A. M., M. D. By Irving D. LeRoy, M. D., of Dutchess County 657
Memoir of Nathaniel M. Perry, M. D. By John C. Jamison, M. D., of Steuben County 659
Memoir of William Thomas White, M. D. By John Shrady, M. D., of New York County 660
Memoir of John Young, M. D. By C. M. Kittridge, M. D., of Dutchess County 662
Reports of the District Branches:
First District Branch 663
Second District Branch 664
Third District Branch 666
Fourth District Branch 671
Fifth District Branch 673
New York County Medical Association. Annual Report 682
Kings County Medical Association. Annual Report 685
Proceedings, Eleventh Annual Meeting 686
Annual Report of the Council 691

List of Fellows, by District and County 699
Alphabetical list of Fellows 722
Retired Fellows 740
Honorary Fellows 741
Corresponding Fellows 741
Deceased Fellows 742
Index 749

OFFICERS AND COUNCIL FOR 1893–'94.

PRESIDENT.

THOMAS D. STRONG, M. D., Chautauqua County, Fourth District.

VICE-PRESIDENTS.

FIRST DISTRICT, ISAAC DE ZOUCHE, M. D., Fulton County.
SECOND DISTRICT, J. C. BENHAM, M. D., Columbia County.
THIRD DISTRICT, H. O. JEWETT, M. D., Cortland County.
FIFTH DISTRICT, J. D. RUSHMORE, M. D., Kings County.

SECRETARY AND TREASURER.

E. D. FERGUSON, M. D., Rensselaer County.

CHAIRMAN OF THE LIBRARY COMMITTEE.

J. W. S. GOULEY, M. D., New York County.

MEMBER OF THE COUNCIL AT LARGE.

C. E. DENISON, M. D., New York County.

ELECTED MEMBERS OF THE COUNCIL.

FIRST DISTRICT, A. P. DODGE, M. D., Oneida County.
" " C. H. GLIDDEN, M. D., Herkimer County.
SECOND DISTRICT, J. B. HARVIE, M. D., Rensselaer County.
" " THOMAS WILSON, M. D., Columbia County.
THIRD DISTRICT, M. CAVANA, M. D., Madison County.
" " F. G. SEAMAN, M. D., Seneca County.
FOURTH DISTRICT, F. H. MOYER, M. D., Livingston County.
" " GEORGE W. GOLER, M. D., Monroe County.
FIFTH DISTRICT, JOSEPH D. BRYANT, M. D., New York County.
" " JOHN D. TRUAX, M. D., New York County.

COMMITTEE OF ARRANGEMENTS FOR 1893–'94.

THOMAS D. STRONG, PRESIDENT,
E. D. FERGUSON, SECRETARY,
Ex-Officio Members of the Committee.

CHARLES E. DENISON, *Chairman.*
JAMES C. MACKENZIE, *Secretary.*

JOSEPH D. BRYANT,
A. PALMER DUDLEY,
JOHN W. S. GOULEY,
GEORGE T. HARRISON,
JOHN D. RUSHMORE,
JOHN SHRADY,
STEPHEN SMITH,
E. H. SQUIBB,
JOHN G. TRUAX.

OFFICERS AND COUNCIL FOR 1894–'95.

The Eleventh Annual Meeting will be held at the Mott Memorial Library, in New York City, on October 15, 16, and 17, 1895.

PRESIDENT.

AUSTIN FLINT, M. D., 60 E. 34th St., New York, New York County.

VICE-PRESIDENTS.

FIRST DISTRICT, D. M. KLOCK, M. D.,
St. Johnsville, Montgomery County.
SECOND DISTRICT, W. H. HODGMAN, M. D.,
Saratoga Springs, Saratoga County.
THIRD DISTRICT, F. W. PUTNAM, M. D.,
Binghamton, Broome County.
FOURTH DISTRICT, M. W. TOWNSEND, M. D.,
Bergen, Genesee County.

SECRETARY AND TREASURER.

E. D. FERGUSON, M. D., Troy, Rensselaer County.

CHAIRMAN OF THE LIBRARY COMMITTEE.

J. W. S. GOULEY, M. D., 324 Madison Ave.,
New York, New York County.

MEMBER OF THE COUNCIL AT LARGE.

C. E. DENISON, M. D., 124 W. 13th St., New York City.

ELECTED MEMBERS OF THE COUNCIL.

FIRST DISTRICT, C. H. GLIDDEN, M. D.,
Little Falls, Herkimer County; term expires 1895.
" " A. P. DODGE, M. D.,
Oneida Castle, Oneida County; term expires 1896.

SECOND DISTRICT, THOMAS WILSON, M. D.,
Claverack, Columbia County; term expires 1895.
" " A. T. VAN VRANKEN, M. D.,
West Troy, Albany County; term expires 1896.
THIRD DISTRICT, F. G. SEAMAN, M. D.,
Seneca Falls, Seneca County; term expires 1895.
" " L. J. BROOKS, M. D.,
Norwich, Chenango County; term expires 1896.
FOURTH DISTRICT, GEORGE W. GOLER, M. D.,
Rochester, Monroe County; term expires 1895.
" " C. G. STOCKTON, M. D.,
436 Franklin St., Buffalo, Erie County; term expires 1896.
FIFTH DISTRICT, JOHN D. TRUAX, M. D.,
17 E. 127th St., New York, New York County; term expires 1895.
" DISTRICT, JOSEPH D. BRYANT, M. D.,
54 W. 36th St., New York, New York County; term expires 1896.

OFFICERS OF THE BRANCH ASSOCIATIONS FOR 1895.

FIRST OR NORTHERN BRANCH.

The Eleventh Annual Meeting will be held at Fort Plain, as appointed by the President and Secretary.

Officers.

President, C. M. KLOCK, M. D., St. Johnsville, Montgomery County.
Secretary, EZRA GRAVES, M. D., Amsterdam, Montgomery County.

Executive Committee.

WILLIAM GILLIS, M. D., Fort Covington, Franklin County.
ISAAC de ZOUCHE, M. D., Gloversville, Fulton County.
THOMAS McGANN, M. D., Wells, Hamilton County.
W. D. GARLOCK, M. D., Little Falls, Herkimer County.
J. MORTIMER CRAWE, M. D., Watertown, Jefferson County.
ALBERT A. JOSLIN, M. D., Martinsburg, Lewis County.
N. A. CALDWELL, M. D., Hageman's Mills, Montgomery County.
G. ALDER BLUMER, M. D., Utica, Oneida County.
E. F. MARSH, M. D., Fulton, Oswego County.
GUY REUBEN COOK, M. D., Louisville, St. Lawrence County.

SECOND OR EASTERN BRANCH.

The Eleventh Annual Meeting will be held at Catskill, Greene County, on the fourth Thursday in June, 1895.

Officers.

President, W. H. HODGMAN, M. D.,
Saratoga Springs, Saratoga County.
Secretary, JOSEPH E. BAYNES, M. D., Troy, Rensselaer County.

Executive Committee.

L. B. RULISON, M. D., West Troy, Albany County.
O. W. HOLCOMB, M. D., Plattsburgh, Clinton County.
J. W. LOCKWOOD, M. D., Philmont, Columbia County.
C. A. CHURCH, M. D., Bloomingdale, Essex County.
GEORGE CONKLING, M. D., Durham, Greene County.
W. H. NICHOLS, M. D., West Sand Lake, Rensselaer County.
C. S. GRANT, M. D., Saratoga Springs, Saratoga County.
CHARLES HAMMER, M. D., Schenectady, Schenectady County.
H. F. KINGSLEY, M. D., Schoharie, Schoharie County.
D. J. FITZGERALD, M. D., Glens Falls, Warren County.
JOHN LAMBERT, M. D., Salem, Washington County.

THIRD OR CENTRAL BRANCH.

The Eleventh Annual Meeting will be held at Binghamton, Broome County, on the third Thursday in May, 1895.

Officers.

President, F. W. PUTNAM, M. D., Binghamton, Broome County.
Secretary, J. H. CHITTENDEN, M. D.,
Binghamton, Broome County.

Executive Committee.

J. G. ORTON, M. D., Binghamton, Broome County.
W. R. LAIRD, M. D., Auburn, Cayuga County.
F. W. ROSS, M. D., Elmira, Chemung County.
H. C. LYMAN, M. D., Sherburne, Chenango County.
F. D. REESE, M. D., Cortland, Cortland County.
W. B. MORROW, M. D., Walton, Delaware County.
M. CAVANA, M. D., Oneida, Madison County.
F. W. SEARS, M. D., Syracuse, Onondaga County.
J. K. LEANING, Cooperstown, Otsego County.
B. T. SMELZER, M. D., Havana, Schuyler County.
F. G. SEAMAN, M. D., Seneca Falls, Seneca County.
W. L. AYER, M. D., Owego, Tioga County.
JOHN E. BEERS, M. D., Danby, Tompkins County.

FOURTH OR WESTERN BRANCH.

The Eleventh Annual Meeting will be held at Rochester, Monroe County, on the second Tuesday in May, 1895.

Officers.

President, M. W. TOWNSEND, M. D., Bergen, Genesee County.
Secretary, WM. H. THORNTON, M. D.,
570 Niagara St., Buffalo, Erie County.

Executive Committee.

J. A. STEPHENSON, M. D., Scio, Alleghany County.
S. J. MUDGE, M. D., Olean, Cattaraugus County.
R. T. ROLPH, M. D., Fredonia, Chautauqua County.
A. H. BRIGGS, M. D., Buffalo, Erie County.
M. W. TOWNSEND, M. D., Bergen, Genesee County.
R. J. MENZIE, M. D., Caledonia, Livingston County.
G. W. GOLER, M. D., Rochester, Monroe County.
W. Q. HUGGINS, M. D., Lockport, Niagara County.
H. W. NICHOLS, M. D., Canandaigua, Ontario County.
H. C. TOMPKINS, M. D., Knowlesville, Orleans County.
C. G. HUBBARD, M. D., Hornellsville, Steuben County.
DARWIN COLVIN, M. D., Clyde, Wayne County.
GEORGE W. PALMER, M. D., Warsaw, Wyoming County.
WILLIAM OLIVER, M. D., Penn Yan, Yates County.

FIFTH OR SOUTHERN BRANCH.

The Eleventh Annual Meeting will be held in Brooklyn, Kings County, on the fourth Tuesday in May, 1895.

Officers.

President, AUSTIN FLINT, M. D.,
60 E. 34th St., New York, New York County.
Secretary, E. H. SQUIBB, M. D.,
P. O. Box 760, Brooklyn, Kings County.

Executive Committee.

EDWIN BARNES, M. D., Pleasant Plains, Dutchess County.
WILLIAM McCOLLOM, M. D., Brooklyn, Kings County.
S. B. W. McLEOD, M. D., New York, New York County.
M. C. CONNER, M. D., Middletown, Orange County.
G. W. MURDOCK, M. D., Cold Spring, Putnam County.
E. G. RAVE, M. D., Hicksville, Queens County.
H. C. JOHNSTON, M. D., New Brighton, Richmond County.
WALTER LINDSAY, M. D., Huntington, Suffolk County.
C. W. PIPER, M. D., Wurtsborough, Sullivan County.
H. VAN HOEVENBERG, M. D., Kingston, Ulster County.
H. E. SCHMID, M. D., Tarrytown, Westchester County,

LIST OF PRESIDENTS AND VICE-PRESIDENTS FROM THE FOUNDING OF THE ASSOCIATION.

1884.

PRESIDENT.

HENRY D. DIDAMA, M. D., Onondaga County, Third District.

VICE-PRESIDENTS.

FIRST DISTRICT, J. MORTIMER CRAWE, M. D., Jefferson County.
SECOND DISTRICT, TABOR B. REYNOLDS, M. D., Saratoga County.
FOURTH DISTRICT, B. L. HOVEY, M. D., Monroe County.
FIFTH DISTRICT,* NATH'L C. HUSTED, M. D., Westchester County.

1885.

PRESIDENT.

*JOHN P. GRAY, M. D., Oneida County, First District.

VICE-PRESIDENTS.

SECOND DISTRICT, WILLIAM H. ROBB, M. D., Montgomery County.
THIRD DISTRICT, JOHN G. ORTON, M. D., Broome County.
FOURTH DISTRICT, JOSEPH C. GREENE, M. D., Erie County.
FIFTH DISTRICT, *JOSEPH C. HUTCHINSON, M. D., Kings County.

1886.

PRESIDENT.

E. M. MOORE, M. D., Monroe County, Fourth District.

* Deceased.

VICE-PRESIDENTS.

FIRST DISTRICT, WILLIAM GILLIS, M. D., Franklin County.
SECOND DISTRICT, H. C. VAN ZANDT, M. D., Schenectady County.
THIRD DISTRICT, *FREDERICK HYDE, M. D., Cortland County.
FIFTH DISTRICT, J. G. PORTEOUS, M. D., Dutchess County.

1887.

PRESIDENT.

*ISAAC E. TAYLOR, M. D., New York County, Fifth District.

VICE-PRESIDENTS.

FIRST DISTRICT, JOHN P. SHARER, M. D., Herkimer County.
SECOND DISTRICT, L. C. DODGE, M. D., Clinton County.
THIRD DISTRICT, *GEORGE W. AVERY, M. D., Chenango County.
FOURTH DISTRICT, DARWIN COLVIN, M. D., Wayne County.

1888.

PRESIDENT.

JOHN CRONYN, M. D., Erie County, Fourth District.

VICE-PRESIDENTS.

FIRST DISTRICT, BYRON DE WITT, M. D., Oswego County.
SECOND DISTRICT, ROBERT SELDEN, M. D., Greene County.
THIRD DISTRICT, CHARLES W. BROWN, M. D., Chemung County.
FIFTH DISTRICT, EDWIN BARNES, M. D., Dutchess County.

1889.

PRESIDENT.

WILLIAM T. LUSK, M. D., New York County, Fifth District.

* Deceased.

VICE-PRESIDENTS.

FIRST DISTRICT, S. H. FRENCH, M. D., Montgomery County.
SECOND DISTRICT, R. C. McEWEN, M. D., Saratoga County.
THIRD DISTRICT, ELIAS LESTER, M. D., Seneca County.
FOURTH DISTRICT, THOMAS D. STRONG, M. D., Chautauqua County.

1890.

PRESIDENT.

JOHN G. ORTON, M. D., Broome County, Third District.

VICE-PRESIDENTS.

FIRST DISTRICT, DOUGLAS AYRES, M. D., Montgomery County.
SECOND DISTRICT, M. H. BURTON, M. D., Rensselaer County.
FOURTH DISTRICT, E. M. MOORE, JR., M. D., Monroe County.
FIFTH DISTRICT, WILLIAM McCOLLOM, M. D. (vice WILLIAM B. EAGER, M. D., deceased), Kings County,

---

1891.

PRESIDENT.

STEPHEN SMITH, M. D., New York County, Fifth District.

VICE-PRESIDENTS.

FIRST DISTRICT, DOUGLAS AYRES, M. D., Montgomery County.
SECOND DISTRICT, A. T. VAN VRANKEN, M. D., Albany County.
THIRD DISTRICT, J. D. TRIPP, M. D., Cayuga County.
FOURTH DISTRICT, ROBERT J. MENZIE, M. D., Livingston County.

1892.

PRESIDENT.

JUDSON B. ANDREWS, M. D., Erie County, Fourth District.

Vice-Presidents.

First District, W. D. GARLOCK, M. D., Herkimer County.
Second District, GEO. E. McDONALD, M. D., Schenectady County.
Third District, LEROY J. BROOKS, M. D., Chenango County.
Fifth District, HENRY VAN HOEVENBERG, M. D., Ulster County

1893.

President.

S. B. W. McLEOD, M. D., New York County, Fifth District.

Vice-Presidents.

First District, R. N. COOLEY, M. D., Oswego County.
Second District, J. C. HANNAN, M. D., Rensselaer County.
Third District, N. JACOBSON, M. D., Onondaga County.
Fourth District, Z. J. LUSK, M. D., Wyoming County.

1894.

President.

THOMAS D. STRONG, M. D., Chautauqua County, Fourth District.

Vice-Presidents.

ISAAC de ZOUCHE, M. D., Fulton County, First District.
J. C. BENHAM, M. D., Columbia County, Second District.
HOMER O. JEWETT, M. D., Cortland County, Third District.
J. D. RUSHMORE, M. D., Kings County, Fifth District.

LIST OF FELLOWS REGISTERED AT ELEVENTH ANNUAL MEETING IN NEW YORK CITY.

Held October 9, 10, and 11, 1894.

FIRST DISTRICT.

HERKIMER COUNTY.

Garlock, W. D., Little Falls.

JEFFERSON COUNTY.

Johnson, P. H., Adams.

MONTGOMERY COUNTY.

Ayres, Douglas, Fort Plain.
Robb, William H., Amsterdam.

ONEIDA COUNTY.

Dodge, A. P., Oneida Castle.

SECOND DISTRICT.

ALBANY COUNTY.

Abrams, H. C., Newtonville.
Van Vranken, A. T., West Troy.

ESSEX COUNTY.

Church, Charles A., Bloomingdale.

RENSSELAER COUNTY.

Cahill, J. T., Hoosick Falls.
Church, T. L., Valley Falls.
Ferguson, E. D., Troy.
Hannan, J. C., Hoosick Falls.
Hannan, T. H., Hoosick Falls.
Phelan, M. F., Troy.

SARATOGA COUNTY.

Reynolds, T. B., Saratoga Springs.

THIRD DISTRICT.

CAYUGA COUNTY.

Laird, W. R., Auburn.

CHENANGO COUNTY.

Lyman, H. C., Sherburne.

Packer, Thurston G., Smyrna.

MADISON COUNTY.

Cavana, Martin, Oneida.

OTSEGO COUNTY.

Leaning, John K., Cooperstown.

SENECA COUNTY.

Bellows, George A., Waterloo.

TIOGA COUNTY.

Ayer, W. L., Owego.

FOURTH DISTRICT.

CHAUTAUQUA COUNTY.

Strong, Thomas D., Westfield.

ERIE COUNTY.

Cronyn, John, Buffalo.

Twohey, John J., Buffalo.

Thornton, William A., Buffalo.

GENESEE COUNTY.

Andrews, L. B., Byron.

Townsend, M. W., Bergen.

Jackson, A. P., Oakfield.

MONROE COUNTY.

Hovey, B. L., Rochester.

WAYNE COUNTY.

Colvin, Darwin, Clyde.

WYOMING COUNTY.

Lusk, Z. J., Warsaw.

FIFTH DISTRICT.

DUTCHESS COUNTY.

Barnes, Edwin C., Pleasant Plains.
Julian, John M., Pleasant Valley.
LeRoy, I. D., Pleasant Valley.
Porteous, J. G., Poughkeepsie.

KINGS COUNTY.

Baker, Frank R., Brooklyn.
Baker, George W., Brooklyn.
Bierwirth, J. C., Brooklyn.
Biggam, William H., Brooklyn.
Brundage, Amos H., Brooklyn.
Coffin, Lawrence, Brooklyn,
Hicks, Edward E., Brooklyn.
Leighton, N. W., Brooklyn.
Lung, Jesse B., Brooklyn.
McCollom, William, Brooklyn.
Minard, E. J. C., Brooklyn.
North, Nelson L., Brooklyn.
Raynor, F. C., Brooklyn.
Risch, Henry F., Brooklyn.
Squibb, E. H., Brooklyn.
Squibb, Edward R., Brooklyn.
Steinke, Hermann, C. O., Brooklyn.
Sullivan, J. D., Brooklyn.
Wieber, George, Brooklyn.

NEW YORK COUNTY.

Baldwin, F. A., New York.
Biggs, Hermann M., New York.
Bryant, Joseph D., New York.
Chrystie, Thos. M. L., New York.
Delphey, Eden V., New York.
Denison, Charles E., New York.
Denison, Ellery, New York.
Dennis, Frederic S., New York.
de Quesada, Gregorio J., New York.
Dudley, A. Palmer, New York.
Dunham, Edward K., New York.
Eliot, Ellsworth, New York.
Flint, Austin, New York,
Gouley, J. W. S., New York.
Hepburn, Neil J., New York.
Holmes, Martha C., New York.
Hubbard, Dwight L., New York.
Janvrin, Joseph E., New York.
Leale, Charles A., New York.
Lockwood, Charles E., New York.
Ludlow, Ogden C., New York.
Lynch, P. J., New York.
MacGregor, James R., New York.
MacKenzie, James C., New York.
Manley, Thomas H., New York.
McAlpin, D. Hunter, New York.
McGowan, J. P., New York.
McLeod, Johnston, New York.
McLeod, S. B. W., New York.
McLochlin, James A., New York.
Miranda, R. L., New York.
Park, William H., New York.
Phelps, Charles, New York.
Pooler, H. A., New York.
Porter, P. Brynberg, New York.
Potter, E. Styles, New York.
Pryor, William R., New York.
Purple, Samuel S., New York.
Ruggles, A. D., New York.
Sayre, Reginald H., New York.
Shrady, John, New York.
Shrady, John Eliot, New York.
Silver, Henry M., New York.
Smith, J. Lewis, New York.
Smith, Stephen, New York.
Syms, Parker, New York.
Truax, J. G., New York.
Van Fleet, Frank, New York.
Walsh, Simon J., New York.
Warner, J. W., New York.
White, J. Blake, New York.
Wiggin, F. H., New York.

ORANGE COUNTY.

Connor, Milton C., Middletown. Vanderveer, J. R., Monroe.

RICHMOND COUNTY.

Johnston, Henry C., New Brighton.

SUFFOLK COUNTY.

Hamill, Edward H. (Newark, N. J.)

WESTCHESTER COUNTY.

Granger, William D., Bronxville.

Summary by Districts of Fellows in Attendance.

First District,	5
Second District,	10
Third District,	7
Fourth District,	10
Fifth District,	80
Total,	112

DELEGATES FROM OTHER MEDICAL ORGANISATIONS AND INVITED GUESTS IN ATTENDANCE.

Connecticut.

EDWARD H. WELCH, M. D., West Winsted. . Delegate.

District of Columbia.

JOSEPH T. JOHNSON, M. D., Washington. . . Invited Guest.

Maine.

GALEN M. WOODCOCK, M. D., Bangor. . . Delegate.

Massachusetts.

JAMES B. AYER, M. D., Boston. . . . . Delegate.
HENRY O. MARCY, M. D., Boston. . Corresponding Fellow.

New Jersey.

C. R. F. FISHER, M. D., Bound Brook. . . Delegate.
E. B. SILVERS, M. D., Rahway City. . . . Delegate.

New York County Association.

R. H. ANDERSON, M. D., New York. . . . Delegate.
SAMUEL BROTHERS, M. D., New York. . . Delegate.
J. CONGER BRYAN, M. D., New York. . . . Delegate.
JOHN GRANT COYLE, M. D., New York. . . Delegate.
H. R. CRONK, M. D., New York. . . . . Delegate.
I. C. EISENBERG, M. D., New York. . . . Delegate.
N. W. FREEMAN, M. D., New York. . . . Delegate.
A. E. GALLANT, M. D., New York. . . . Delegate.
CHARLES W. GARDNER, M. D., New York. . Delegate.
GISSNER HARRISON, M. D., New York. . . Delegate.
J. C. LAY, M. D., New York. . . . . Delegate.
J. SWIFT WEBB, M. D., New York. . . . Delegate.

PENNSYLVANIA.

LAWRENCE F. FLICK, M. D., PHILADELPHIA.	Invited Guest.
JOSEPH S. GIBB, M. D., PHILADELPHIA.	Invited Guest.

RHODE ISLAND.

J. HOWARD MORGAN, M. D., WESTERLY.	Invited Guest.

VERMONT.

F. W. GOODALL, M. D., BENNINGTON.	Delegate.

ADDRESS OF WELCOME AND REPORT OF THE COMMITTEE OF ARRANGEMENTS.

By Charles E. Denison, M. D., of New York County, Chairman of the Committee.

October 9, 1894.

Gentlemen: The Fellows of New York county extend to you a hearty welcome to the eleventh meeting of this Association, and hope you will enjoy the intellectual feast prepared for you. The programme, which was sent to every Fellow of the Association and invited guest two weeks before the meeting, offers two addresses, a discussion on an important and interesting subject, and forty-eight scientific contributions.

The five districts of the state, and sister states, are represented in the following proportions:

First District	2
Second "	3
Third "	5
Fourth "	7
Fifth "	27
Massachusetts	2
Ohio	1
Pennsylvania	2
Washington, D. C.	1
	50

In these five districts, Fellows of the Association from fifteen counties have contributed as follows:

Second District,	Albany county	1
Third "	Broome "	1
" "	Chautauqua county	1
" "	Cortland "	2

Fourth	District,	Erie county	2
Second	"	Green "	1
Fifth	"	Kings "	2
Fourth	"	Monroe "	2
First	"	Montgomery county	2
Fifth	"	New York "	25
Third	"	Onondaga "	2
Second	"	Rensselaer "	1
Fourth	"	Steuben "	1
"	"	Wayne "	1
"	"	Wyoming "	2
			44
Sister states			6
			50

The classification in accordance with the subject-matter is as follows:

21 are on Medicine.
15 " Surgery.
7 " Obstetrics and Gynaecology.
2 " Rhinology and Laryngology.
1 is on Materia Medica and Therapeutics.
1 " Bacteriology.
1 " Hygiene.
1 " Ophthalmology.
1 is not stated.

THE PRESIDENT'S ADDRESS.

By Thomas D. Strong, M. D., of Chautauqua County.

October 9, 1894.

Gentlemen and Fellows: In assuming the duties of President, I wish to most heartily thank you for the honour. To me it is the highest medical honour that can be conferred in the state of New York.

Year by year as I have attended the meetings of the Association since its organisation, my interest in it, and my respect for its founders and their motives, have steadily increased.

Since our last meeting the name of another of our presidents has been added to the necrological list. Dr. Judson B. Andrews was one of the founders of this Association, and heartily did he give his time and influence to maintain its principles and further its ends.

He was an alienist of the highest rank, a scholar, a gentleman. His special field did not narrow his view of the broad field of general practice. By the Fellows of this Association, and especially by those of the Fourth district, who were more intimately associated with him, will his fair name be cherished with respect and love.

This Association had certain definite objects in view. The founders had been cut off from their affiliation with the American Medical Association by the organised and ruthless work of a few men. Our state society had voted itself out of the good company of the great mass of our best medical men, and our association with all well organised medical societies was completely severed. Knowing the character of the founders of this Association, could one expect them to have taken any other course than that pursued?

The affiliation with cheap men and quacks, who interpret license to be liberty and rejoice in their so-called freedom,

had no charms for those who know that the highest liberty is conformity to law. These ten years have verified the anticipated successful results of that meeting in the Delavan parlours. With propriety may we rejoice that our honourable code is recognised and sustained in the state of New York by this well organised, living, thinking, working Association, and especially that the American Association has not been loosed from its moorings by the influence of the New York disorganisers and those in sympathy with them in other states.

The specified objects of the Association are,—The cultivation and advancement of the science of medicine; the promotion of the public health; the maintenance of the honour and character of the medical profession; the furthering of cordial professional relations with the medical profession outside our state.

How shall these ends be accomplished?

For many years there has been a steady effort, by eliminating the weak and incompetent element, and by improving the better element. We call to mind the time when even schools of good name demanded only two four to six months' courses of lectures, the second a repetition of the first, with no preliminary requirements. Since that, many influences have combined to radically change the requirements for graduation, until now many states make it a legal *necessity* to have some mental training, and many of our medical colleges have a high standard for entrance and graduation.

Our Association has steadily favoured a higher education.

The American Academy of Medicine, whose members are all college graduates, have exerted a powerful influence by their personal private efforts, and by a wonderful literature bearing upon the necessities of a high standard of education in our schools and higher aims in our students.

The associated medical colleges are doing still more for the immediate and rapid change for the better in the college curriculum, and for sufficient preliminary education to enable the student to profitably follow the course.

The State Board of Health of Illinois, by their intelligent grading of medical schools, rejecting the graduates from the lower grade as unfit practitioners, took the labouring oar and did much to forward the movement and assist other states to enact their medical laws.

Our army and navy examinations, which give to them their noble corps of educated medical men, are also exerting an active and widespread influence.

Our universities are demanding that the liberal professions shall be university graduates, to which only those are eligible who have a liberal, a college, education. My sympathies are altogether with them.

The members of liberal professions have obligations commensurate with the honours conferred upon them, and they are not limited to their own profession. Their works should commend them as worthy to be ranked with the best in the other professions. We have too many cheap, ignorant doctors, and we have too few high grade men. Not only do our obligations extend to our profession, but in all communities a doctor should wield an influence in society, in schools, in church, and in state, that shall be felt for good alone. To fill his high mission, he must be a matured, well-developed, well-balanced, cultured man.

In early life the beginning of Latin is a day of promise to any well-brained boy. A steady, continuous course is marked out. It becomes a *back-bone* to which the lesser and disconnected members attach themselves. His English becomes classical; his Greek and Mathematics and Sciences attach themselves to the well-developed spine, and grow to a complete form of beauty and strength.

In the study of classics, his habit of thought and investigation is a constant training in the accuracy of thinking and language. The true idea must be sought out, as affected by modifiers and limitations, and only when these all harmonize is the conclusion found and the mind satisfied. How closely does the process of reasoning compare with that in the investigation of disease, and its accurate diagnosis. The

student cannot reduce his reasoning to mathematical exactness. The square of the hypothenuse applies to but few medical problems. The nature of the disease, and the influence of the environments, envelop them in doubt. Let the college student be educated, giving him mental discipline, self-control, the power of concentration, and to use them with strength and facility. The influence of education on character is beneficial just in proportion as it is broad, liberal, and symmetrical.

Why have the classics, the humanities, occupied so prominent a place in all advanced education? Simply because they best answer the ends to be accomplished in mental culture. Time has not weakened the demand for them in our best schools, and it should give great weight to our estimate of their value, that for centuries they have held their place as indispensable in a liberal education, and that by the highest grade of scholars, thinkers, and educators.

The student should be in no haste in choosing a profession. It is early enough when he is developed and matured, at least as much as by a college education. He is then fit for professional study. He enters the medical school fitted for work. His mind is in full activity and disciplined to steady thought. Greek and Latin terms are to him full of meaning. Very quickly can his classmates and teachers see his vantage ground over those with limited preliminary acquirements.

Dr. Sandford Eastman, then dean of the faculty of the University of Buffalo, once said to me that, after an oral class examination before the curators for their diplomas, a curator, to whom the students were entirely unknown, handed to him a list of names, and said,—"These are college men." Dr. Eastman was astonished to see that every one was so, and, what was more, there was not another in the class. What in that curator's observation selected these men? Their use of terms, their concise language, and general bearing were enough. This strongly indicates that there is a *something* about classical, cultured men that distinguishes them from all others.

Some of our ablest medical men are not college educated. Their natural ability, with their indomitable courage, has developed them, in spite of hindrances and the embarrassments of their surroundings, till they are worthily ranked with the best. These same men will not claim that a liberal education would not have made them better men. They are very certain not to send their sons into the profession with defective preliminary education.

There is a surrounding atmosphere in college life, with its continued and elevating influence. For four years the student is constantly under its silent influence. He is surrounded by classmates who are his equals, some, perhaps, superiors. If he would maintain a good name in his class, he must show himself a man day by day. His teachers are in touch with him, with their breadth of culture fitted to guide and aid him, and exerting their influence to develop him in mental strength, culture, and character.

Objection is raised by some that a college course takes too much time, and delays too long the entrance upon professional work and its financial rewards. A youthful doctor is not eagerly sought by the public, and the years spent waiting would be far more valuable if devoted to hard, systematic study under wise teachers and favourable surroundings. A young doctor of twenty, one who has hurriedly rushed through the quickest course, only bent upon graduating, will have ample time to regret it. He will meet older men, of broader culture, in practice and upon the floor of medical societies. He will necessarily suffer by comparison in the judgment of his peers, and will lose confidence in his own judgment. He is of good material, or he is liable to become discouraged and think he has mistaken his calling, or drift into some irregular course. If the same young man had spent these years in developing and maturing his powers, he would at thirty have been fit to *carry* his cares and responsibilities with the respect and esteem of his brother physicians and his patrons.

A *man* at thirty is better than a *doctor* at twenty-one. The

abundant yield of perfectly matured corn in the western field has had a *long* season of rain and sunshine for its growth. If the season is *shorter*, there is a necessity for a smaller kind and a lesser crop.

A CASE OF LATERAL LITHOTOMY FOR THE REMOVAL OF A WIRE NAIL, ALLEGED TO HAVE BEEN IN THE BLADDER FOUR YEARS.

By Zera J. Lusk, M. D., of Wyoming County.

October 9, 1894.

J. B., labourer, twenty-five years of age, gave the following history of his case:

He said that four years before he attended a raising in the country, and that he became beastly drunk; that when he recovered from his stupour he had great pain in the bladder, and passed blood freely when he urinated. He claimed that he was ignorant of the cause until some children told him that while he was sleeping some men pressed a nail into the penis and could not remove it, and it entered the bladder. He never could learn just who did it; that since then he had had frequent haemorrhages, and excruciating pains at times.

I found on examining the bladder with a sound that it readily came in contact with a foreign body, which emitted a much louder and sharper note than follows striking a calculus. I found it difficult on some examinations to locate or even find it; at other times no trouble was experienced, indeed it was struck by the sound the moment it entered the bladder.

Arrangements were made to operate for its removal, and on May 23, of the present year, in the presence of Drs. Adams, Palmer, and Wilson, of Warsaw, N. Y., and Peddle of Wethersfield, I did the lateral lithotomy operation.

After having incised the prostate sufficient to permit the introduction of a finger, I had no trouble in locating the

offending object. The nail was firmly fixed, occupying a position antero-posteriorly, the sharp point being directed upward and forward and penetrating the mucous membrane at one inch from prostatic outlet and resting against the pubic bones. The head of the nail was firmly embedded in the mucous coat of the fundus; I succeeded in liberating the point of the nail by forcibly depressing the fundus of bladder, when, without difficulty, I removed this ten-penny wire nail, which measures three inches in length. Scarcely any blood was lost, and rapid recovery ensued, indeed in ten days he was passing urine by the urethra, and was up and about. There was no deposit; on the contrary the nail was as perfect as it now appears.

Three months before, he consulted, to my knowledge, a neighbouring physician for haematuria, and when I asked him why he did not state his case fully to the doctor, his reply was that he was ashamed to do so. I am led by this to conclude that he was the cause of his trouble; that he introduced the nail himself; that it was entered head first into the urethra, and in trying to remove it the sharp point of the nail pricked the sensitive mucus lining, and in the effort to get relief he pushed it further and further, until it was forced into the bladder.

In looking up reports of cases of foreign bodies in the bladder, I can find no parallel to the above case; hair-pins, tooth-picks, goose-quills, and the like, have been found in the bladder of masturbating females, and of those endeavouring to produce abortion, but nothing of the like from the bladder of the male.

REPORT OF A CASE OF TRAUMATIC EPILEPSY: RECOVERY.

By Zera J. Lusk, M. D., of Wyoming County.

October 9, 1894.

I report the following case, believing it of interest on account of its verifying the topographical geography of functional brain centres, especially in this case, those of speech, expression, and the muscles of the face, chin, and right arm:

S. H., Syrian, twenty-two years of age, was brought to my office, Sunday, September 3, 1893. He had evidently been in a fracas, for on examination I found fracture of the middle third of the right ulna, and compound fracture of the upper third of the ulna of the left arm, the latter being caused by a stab through the bend of the elbow, completely severing the olecranon process, which was drawn upward nearly two inches by the triceps.

Nothing could be learned from him as to the cause of his injuries. He appeared to be only able to use profane language, which he did most profusely while I was dressing the fracture. It was at first supposed that he was an Italian, and that he refused to talk about his injuries on account of fear from his enemies.

After dressing the fracture, he was assigned quarters and placed in care of competent nurses. I saw him in the evening, and found him restless and excited, requiring two men to keep him on the bed. He was quieted for a time by ¼ grain of morphia, hypodermically. Monday, the 4th, had been restless through the night and continued so through the day, constantly trying to get up. Temperature at 6 p. m., 99°, pulse 112. Tuesday, 6th, complete aphasia, peculiar con-

vulsive twitches of the muscles of the face and chin, saliva flowed profusely from the mouth, face expressionless, idiotic, and vacant in appearance. Wednesday, 6th, convulsions occur every two hours, limited to the face and right arm. These continued to increase in number and severity until Tuesday, 13th, nine days from the receipt of his injuries, when he was having from twenty-eight to thirty convulsions every twenty-four hours.

During this time he had become so emaciated that one would scarcely believe him to have been the strong, robust chap of a week before. It was evident that his end was near unless he obtained immediate relief. I was positive there was compression over the centres which controlled the muscles that were now so often in clonic spasm. The district attorney finally told me to treat the case as I thought best, and on the following day, with the aid of Drs. Palmer, Wilson, and Peddle, I operated in the usual way for trephining.

On raising a large "U" shaped flap on the left side of the head over the speech centre, there were revealed two fractures, the longer one beginning one inch in front of the superior stephanion and extending nearly vertically backward 3½ inches; the shorter fracture began at the superior stephanion and extended obliquely downward 2½ inches. Between these was a triangular plate of bone, depressed, with its acute angle directed upward and terminating at the junction of the two fractures.

I trepanned within this triangle one inch from the depressed point, removing a button one inch in diameter, underneath which was a firm epidural clot nearly two inches long by one inch wide and one half inch thick. I removed the triangular piece of bone with the elevator and broke up the clot along the edges of the fracture, but did not try to clear it all out for fear of haemorrhage. I dusted iodoform over the exposed surfaces, introduced a few strands of aseptic silk thread for drainage, and closed by uniting the flaps with interrupted sutures. Antisepsis was observed throughout the operation.

He rallied nicely, and on the third day I removed the drainage and on the seventh day all the dressings except the sublimated gauze and cotton cap. During the twenty-four hours preceding the operation he had twenty-eight convulsions; during the twenty-four following he had eight; in the next twenty-four hours four, and from this time they ceased altogether. In place of the idiotic, expressionless appearance, normal expression and intelligence returned; on the third day he could say "Yes" and "No," on the fifth he could speak his name, and from this time the normal functions rapidly returned, so that in two weeks he was able to be up and about the room. A peculiar feature of this case was that during convalescence he could talk in and understand our language, but could not converse or read in his own, nor could he hold conversation with his Syrian friends. He had been in this country only one year, so that our language was difficult for him to speak. This continued for twenty-seven days, when one morning he looked up smilingly and said he wanted his letters, that he could read and speak in his own language. He said when he awoke in the morning it was all clear to him.

This case is of interest because it positively verifies the centres of the brain which preside over speech, the muscles of the face and right arm. The clot covered the lower portion of the fissure of Rolando, and the intervening space between that and the ascending part of the fissure of Sylvius. There was at no time previous to operation any perceptible injury to the head. I was guided in my location for trephining entirely by the character of the symptoms. I report this case not with an idea of adding anything new, but to confirm the localisation of brain functions, a subject which is now receiving such profitable study. The phenomenon of his understanding our language instead of his own, is explained by his hearing our language spoken when the functions were being restored, and hearing no other he could not recall his own language until the functions had regained normal activity.

The injury to the head was caused by his being struck with a large club in the hands of an Italian standing behind him. He stood with his arms folded looking out of a window when he was struck, and he hence could give no statement as to how he was injured.

DISCUSSION.

(On the preceding two papers.)

Dr. M. W. Townsend, of Genesee county, said he would like to ask whether it was proper to call this a case of epilepsy, and also whether the man could swear well without being able to say anything else.

Dr. John Cronyn, of Erie county, said that some years ago he had a case in which a young man had introduced a piece of willow into the urethra, and a portion about three inches long had been broken off and had slipped back. He was reminded of the case by the nail just exhibited.

Dr. E. D. Ferguson, of Rensselaer county, said regarding the question of cerebral localisation in the second paper, that he was reminded of a case of his own which had not been reported hitherto. In his case there were no convulsive attacks, Jacksonian epilepsy, or any other form of clonic trouble, but it was interesting because it did not admit of localisation according to the schemes at present laid down. When it was remembered that disturbed function might occur from injury at a remote point, from reflex influences, from pressure, or otherwise, we should not count too closely on finding the lesion just where the physiological and anatomical centres were known to be located. His patient was a man who had fallen from a tree and had been unconscious for a short time after the accident. When first seen by the speaker, about one week later, he was complaining, as he had been doing ever since the injury, of severe pain in the head. This pain, however, was not localised. There was no evidence of injury to the skull as determined by external examination, but on account of the severe and continuous pain he felt that there must have been some intracranial injury. There was, however, no paresis, no spasmodic action of the muscles, and no intellectual disturbance, consequently there was nothing to do but to wait. It was suggested to the attending physician that when there was any evidence of localisation by convulsions, paresis, or other cerebral disturbance, it would be time to interfere. A few days later, being requested to see the man again, he found that the patient was unable to abduct the arm from the body. The pain was unchanged, and there was slight fever. According to the schemes of localisation, one would have expected to find the injury rather high up on the fissure of Rolando. He trephined at about the middle of this fissure on the right side, but on removing a

single button of bone everything seemed to be normal, and also after removing a second button lower down; but on introducing the finger and separating the dura mater, it was found that low down near the base of the cranium there was a clot of blood. A third button of bone was then removed, and the bone removed between these openings with the rongeur, and the clot of blood, which was about the size of a hen's egg, was removed. The patient made an uninterrupted recovery. The operation was done about one year ago, but it was only within the last two or three months that the man regained the complete use of the deltoid muscle.

Dr. DARWIN COLVIN, of Wayne county, said that in the Medical and Surgical History of the War of the Rebellion there was reported a case of trepanning which he had done on a soldier. A young man had been shot and left on the field of Gettysburg over night. He was then removed to the hospital. About four years later he began to have epilepsy, and the attacks became more severe and more frequent. Before he had learned on which side the patient had been shot, the patient stated to him that the first symptom he had noticed was a spasmodic action of the left arm which preceded the loss of consciousness for some time. This was before the time when much was known regarding cerebral localisation. The speaker decided that there must be a depressed portion of bone on the right side of the skull, and accordingly performed trepanning. The dura mater was exceedingly brittle, and on depressing it a spicule of bone was discovered pressing on the dura. Another button of bone was removed, and the spicule of bone taken away, but still the dura mater appeared to be depressed. The man had but one epileptic attack after this operation. From the History of the War of the Rebellion he had learned that there had been very few cases of epilepsy following gunshot wounds, and that his was the only one recorded in which recovery had occurred.

Dr. LUSK, in closing the discussion, said that his case was one of *traumatic* epilepsy, that is, the convulsions were of an epileptiform character. The man could say "Help," "Hurt," "Good Doctor," and could swear at the time he was first injured. After a day or two he was unable to swear, and his power to do so did not return until after the operation. The centre of speech was considered to be on the left side of the brain near the fissure of Rolando.

Dr. TOWNSEND did not think there was any evidence that the man had convulsions before he was injured. It seemed to him wrong to call occasional convulsions *epilepsy*. Epilepsy was properly a long series of convulsions. The case reported therefore should not be called one of epilepsy.

Dr. COLVIN thought that Dr. Lusk was right, but that he should say *acute* epilepsy. We did not say that a pregnant woman had epilepsy, and yet her convulsions were epileptic in character.

Dr. Douglas Ayres, of Montgomery county, thought that the word "traumatic" indicated the nature of the convulsions in Dr. Lusk's case.

Dr. Jackson said he would suggest the word "epileptiform" convulsion.

Dr. Lusk laughingly asked, "Why not Jacksonian?"

Dr. Cronyn said that aphasia was well known to be a paralytic condition, in which the patient occasionally said the opposite of what he intended to say, and probably, therefore, when the man swore he had intended to pray. It seemed to him that it was the method of attack, and the continued features of spasm during the pressure of the bone, that gave the characteristic features to the attack of epilepsy.

A NEW, NON-CONDUCTING SPECULUM, FOR USE IN POST-PARTUM AND POST-ABORTUM INTRA-UTERINE DOUCHING.

By Eden V. Delphey, M. D., of New York County.

October 9, 1894.

1

About two years ago, I had a severe case of puerpera septicaemia, in the treatment of which I desired a speculum which would enable me to irrigate the uterus with hot water—in fact, so hot as to cause pain to the sensitive perineal surface. Believing that all sorts of specula had been invented which could be invented, I tried the instrument makers for such a one, but without avail.

I have experimented with several different shapes, sizes, and forms of blades, handles, etc., during this time, and have decided on the one now presented.

It is made of hard rubber, vulcanized on the mould, and will therefore retain its shape no matter how hot the water is in which it may be placed. The blade is similar to a Sims, but without the duck-bill tip. The handle is simply a prolongation or continuation of the bottom and sides of the blade, and is joined to it at an angle of about 75°, the handle forming a trough for conducting the solution and débris to

a receptacle beneath. The edges of the trough-handle are slightly cut away, about half way down, to afford a better grasp in holding. At the bottom are two notches and a hole, to which the bail of a pail can be either hung directly or fastened by means of a hook, thus making the instrument self-retaining in certain cases.

The instrument is intended for use in post-partum and post-abortum intra-uterine douching and in curetting, and the advantages claimed are:

It is simple, light, and cheap.

It is a non-conductor of heat, and therefore protects the sensitive perinaeum.

It does not corrode.

It can be easily cleaned and rendered aseptic, either by chemicals or boiling.

It can be held by an assistant, or it can be made self-retaining in certain cases.

The débris can be seen as it escapes through the trough-handle to the receptacle beneath.

SOME INTERESTING CASES OF APPENDICITIS.

By Joseph D. Bryant, M. D., of New York County.

October 9, 1894.

Believing that the results of experience constitute the only true guide to the wisdom and efficiency of any measure, especially one of a surgical nature, I have, therefore, no hesitation in placing before you now for the purposes of thought and practice a record of four cases of appendicitis, that have recently come under my observation, together with the lessons they teach.

Case I.—That of E. B. J., M. D., of Pennsylvania, aged twenty-eight, and of good habits in all respects. This patient came to my office for consultation and treatment June 13, 1894, with the following history:

1. Had always been in good health up to the time of the first attack of appendicitis.

2. Had suffered from four attacks of this disease before coming to my notice, from the last of which he had just recovered.

The first attack happened without apparent cause, during the last week of November, 1893, six months before I saw him. This attack was a slight one, lasting but three or four days, and was not severe enough to prevent proper attention to the office duties.

The second attack happened about six weeks later, and was not severer at the outset than the first one. This attack lasted four days, and on the second day a slight chill occurred, attended with some elevation of temperature. Subsequent to this attack, tenderness in the right ileo-inguinal region was constant in a varying degree. No definite tumor was discernible.

The third attack was about three months after the second one, and it will be noticed that this was the severest attack of all. This, like the others, came without apparent cause, but unlike them was announced by a sudden sharp severe pain, which obliged the patient to go to bed at once, where he remained for the next four weeks. During the greater portion of this time he had a marked elevation of temperature, which, however, did not reach above 101 F. per rectum during the entire course of the attack. A hard, tender tumor made its appearance in the right iliac region during this attack which increased to the size of one's fist; then gradually diminished in size and sensitiveness, but did not wholly disappear.

The fourth and final attack occurred May 30, 1894, or only about two weeks after recovery from the third. This attack resembled in all essential respects, the first and second ones. At all events, following this one the patient made a long journey by rail and reached this city June 13, 1894.

A physical examination at the time of arrival disclosed a hard, tender, and somewhat movable tumor, about the size of a hen's egg, located in the ileo-inguinal region, somewhat nearer the brim of the pelvis than to the iliac spine. Rectal examination revealed nothing abnormal. In all other respects the patient was in as satisfactory condition as the fatigue of the journey and previous illness would warrant. Since the patient had come expressly for the benefits of an operation, and was professionally qualified to estimate the advantages and dangers attending it, and was anxious for immediate action, he was sent at once to St. Vincent's hospital, where it was performed on the following day in the presence of many of the visiting and house staff of the hospital. I will not weary you with the details of the operation, which are already worn threadbare by repeated description from other sources, but rather submit at once, in one, two and three order, those phases of it that are always essential to advancement—that is, the disclosures attendant on the procedure. At this time it seems to be proper to say, owing to the nearness of the tumor to the pelvic brim, the mobility and ease of its delineation, that I expressed the opinion before operation that the diseased appendix extended downward and inward to, and possibly over, the brim of the pelvis, and had a long mesentery.

1. The incision made through the abdominal parietes was about five inches in length, and was located about two inches from the anterior superior spine of the ilium and directly upon the *inner* portion of the ileo-inguinal tumor.

2. No difficulty was experienced in exposing the tumor, which was found to consist of the major part of the appendix surrounded by abundant inflammatory exudation. Only the extreme end of the appendix—about one half inch—was entirely free from the exudation. This extremity was attached slightly to the peritonaeum covering the brim of the pelvis; so slightly in fact, that, although easily detached, there was great danger of rupture, as the structure was frail by reason of internal ulceration.

3. No adhesion between the tumor and the anterior parietal peritonaeum existed, nor was there evidence of present or past suppuration.

4. The tumor was located below the so-called caecum, was attached to its under surface, and extended toward the cavity of the pelvis.

5. No evidence of complete perforation of the appendix could be found. Great difficulty was experienced in exposing the portion of the appendix imbedded in the exudation.

During the course of the manipulations directed to this object, the frail pultaceous extremity of the organ was easily torn off. However, this accident afforded the opportunity at once of passing a small grooved director into the remaining portion of the appendix for about one inch,

then an obstruction was met, which was found to be caused, first by a complete occlusion of the lumen at that point, and second, by a nearly right-angled bend of the organ. This portion of the appendix and the super-imposed lymph were divided with scissors, thus exposing the lumen to the point of constriction. Afterwards, with some difficulty, the constriction was overcome, and a probe was passed through the remaining inch of the appendix into the caput coli. This, the latter part of the appendix, was much dilated and contained offensive fluid material, while the remaining portion of the organ contained inoffensive pultaceous matter. The appendix was tied within one half inch of the coecum and the remaining external portion was slit up in the manner before described and cut off at the seat of ligature. On account of the obstinate capillary oozing that attended all efforts to dissect the appendix from its environments, a complete removal was not accomplished. However, all offensive matter was scraped away together with much of the appendix itself: the external incision was reduced to two inches in length by wire sutures. The wound, after thorough disinfection, was slightly packed with iodoform gauze, and the patient put to bed.

The remaining portion of the history is entirely uneventful. The temperature at no time rose above 101, 4, F, per rectum, and after a few days' subsistence on milk, koumiss, and the like, he was permitted to partake of a more substantial diet. At the end of two weeks he was allowed to sit up, and was discharged about four weeks after operation. At the time of discharge there was a very small sinus, thread-like in size, leading down into the wound. This was due, no doubt, to the presence of the silk ligature there, employed to tie the appendix.

Case II. A. P. S., farmer, aged forty-five, temperate and with good family history. This patient came under my notice through the advisement of Dr. L. J. Brooks, of Norwich, N. Y., on June 18, 1894, with the following history:

1. Had always enjoyed good health until the summer of 1893, during which season he had suffered from occasional diarrhoea and uneasy sensations in the "right side of the belly," as he expressed it.

2. Suddenly, in September, 1893, he was attacked with severe pain at the right side of the lower part of the abdomen, and for this reason was obliged to go to bed, where he remained for two weeks. Swelling occurred at the seat of the pain and it was tender there. However, the swelling gradually subsided as the attack "wore off." He made a slow recovery, resuming labour sometime in November. He did not regard himself as well then, since he was unable to perform the usual amount of labour, and suffered from great despondency at the same time.

3. Suddenly, on April 9, 1894, he was again seized with severe pain in the same region, and was confined in bed for eight days.

4. Since the last attack the patient has had more or less soreness and dragging sensation in the right iliac region and has been unable to work.

5. The pain attending the attack radiated toward the ribs of the right side and down the right thigh. Following the attack he suffered frequently from a dull pain extending down the left thigh. Neither vomiting nor diarrhoea attended the attack, and his appetite was unimpaired.

Physical examination revealed no organic disease. In the right ileo-inguinal region a small, slightly tender and movable tumor could be easily outlined. It was situated about two inches from the anterior superior spinous process of the ilium and extended directly downward, which the patient said had been the seat of all previous acute local pain and tenderness. He was advised to submit to an operation at once, for the double purpose of removal of the appendix and relief from despondency. Accordingly, on June 30, 1894, he was subjected to an operation in the presence of the visiting and resident staff of the hospital, Drs. Brooks and Harris of Norwich, N. Y., Dr. Erdman and Dr. Stewart, and other invited guests. The operation developed the following items of interest:

1. The incision was made directly upon the tumor, as there was no reason to believe that it extended toward the pelvic cavity.

2. It was placed about two inches from the anterior superior spinous process of the ilium.

3. No difficulty was encountered until after the division of the peritonaeum. Then there was found to be a thick layer of distorted omentum lying in front of the caput coli. This structure extended down to Poupart's ligament and was everywhere attached to the abdominal wall, except at the outer border of the incision.

4. The caput coli was bound down by old adhesions and rolled outward so that the fibrous band, leading to the base of the appendix, could not be seen until after the separation of the gut from the abdominal wall and its normal replacement.

5. The appendix was turned upward and outward below the caput coli in such a manner as to cause the apex to lie to its outer side.

The organ was entirely enveloped with dense lymph, somewhat vascular, but easily separable from the contiguous tissues. There was no perforation of the appendix. The lumen was distended with jelly-like inoffensive products.

6. At the outer side of the upper part of the caput coli was found a small amount of caseous pus, evidently the product of an antecedent inflammation.

Such were the conditions and in the order of their appearance. It may be well now to speak of the technic employed to meet the unusual ones. The interposition of distorted and adherent omentum is not of common occurrence in my experience. However, the obstacle was easily, though slowly, overcome by tearing an opening through the tissue over the seat of the caput coli. It was believed that this bowel would promptly protrude as soon as the measure was taken, and consequently expose to view the fibrous band of the colon that leads to the base of the appendix. Such, however, was not the case, as only small intestines

appeared and the caput coli was nowhere observable. The edges of the wound were then drawn widely apart, and, after careful sponging, an "account of stock" at hand, was taken. It was seen, after careful scrutiny, that the ilium appeared to arise from the anterior surface of the head of the colon instead of the accustomed location, and that the head of the colon was raised outward, which, of course, explained the unique relation of the ilium to it. The adhesions were easily separated, the head of the colon placed in the proper position, the appendix and the surrounding exudate separated *en masse*, appendix tied with a silk ligature, cut and removed. The caseous pus was dissected and scraped away; haemorrhage checked, wound partially closed, and dressed as in the preceding case. In this case I think the wound could have been permanently closed with safety. But, inasmuch as pus products might have tainted it, despite the closest attention, I deemed it wiser to treat it by the open method. The patient made an uneventful recovery, the temperature at no time going above 101 F., per rectum, and this for a day only. In two weeks he was permitted to sit up, and in six weeks was sent home in a most cheerful mood.

Case III.—Mr. S., aged twenty-seven, student, good family history. This patient came to my attention on July 3, 1894, in St. Vincent's hospital, from a neighbouring city. He gave the following history:

1. Had been the subject of diarrhoea for a long time before the appearance of any complicating trouble.

2. During the summer of 1891 he had an attack of diarrhoea and vomiting, in the course of which he was seized suddenly with a severe pain in the right side, followed by tenderness there and an exaggeration of the first-mentioned disorders. As the result of these manifestations, he was confined in bed for five days, but at the end of two weeks he regarded himself as well again, notwithstanding the slight tenderness yet remaining in the right inguinal region. He declares that he had a fever during this attack.

3. Twice after this, at intervals which he is unable to recall, he was confined in bed for a short time with diarrhoea and pain in the right side.

4. Suddenly, in November, 1892, he had a severe attack, and was confined to the bed for two weeks and was unable to work for three weeks thereafter. During this attack the axillary temperature was somewhat increased. The effect record is in doubt.

5. After this attack he was able to attend to his duties with comparative comfort, although he suffered from pain in the side only as the result of indigestion and active exercise.

6. During the last two winters he has been afflicted with a severe cough, which disappeared with the incoming of spring. Thinks he may have had malaria at that time.

Physical examination shows the patient to be organically sound. Slight tenderness can be elicited on deep pressure in the right iliac fossa at the place where previous tenderness had existed. The presence

of tumor could not be detected. In view of the long continued trouble and the clear history of previous attacks of appendicitis, as diagnosticated by very reputable physicians at his native place, and the seeming loss of courage to continue his labors without operative aid, I advised prompt operation, which was done on July 9, in the presence of many of the visiting and the surgical staff of the hospital. The following items will be of interest in connection with this case:

1. No tissues were cut except those lying on the aponeurosis of the external oblique and those beneath the transversalis muscle. The opening was made in each of the other tissues by separating the fibres of the respective structures in the long axis at a point directly over the caput coli. The sub-transversalis tissues were divided in the same direction as were those above the external oblique. It is apparent at once that this plan of procedure permits the separated fibres to return to their proper relationship when all restraint is removed, thus securing to the abdominal wall the greatest possible strength at the seat of the operation, and doing all that is possible at that time to obviate consequent hernia. The peritonaeum and the integument, with their associated tissues, were united in the manner common to each. To Dr. McBurney belongs the credit of what now appears to be a most valuable suggestion in the technic of abdominal incisions for this trouble. When this course is taken, it is contemplated that the wound shall be closed at once, which was done in this case; however, I am of the opinion that similar steps are proper when the wound is to be treated by the open method, and for similar reasons also.

2. The appendix was not less than five inches in length, and extended into the pelvic cavity. No evidence of present or past disease was seen except that indicated by the congested appearance of the appendix itself, which was best marked near the extremity. An incision into the lumen, made by Dr. Gouley, disclosed the presence of a small faecal concretion surrounded by a surface of well-advanced ulceration. (Specimen.) The appendix was ligatured with cat-gut and removed, leaving a stump about one half inch in length. This patient made a prompt recovery so far as the operation was concerned, the wound healing by first intention without an unfavourable local manifestation. During the course of recovery, however, the patient experienced an attack of sub-acute pleurisy of the left side, and also of mild malarial fever. For these reasons it is impossible to properly estimate the symptoms dependent on the operation alone.

Case IV.—Lieut. C. F. P., aged thirty-two, member of the U. S. A. This patient's previous history is good in all essential respects. He came to my attention August 16, and was referred to St. Vincent's hospital for operation two days afterward. On admission, the following history was elicited:

1. Was perfectly well until May, 1888, when, without apparent cause, he was seized with a sudden severe pain in the right inguinal region, which was so intense that he could not move. At the end of a week a

considerable tumor was found in the right inguinal region, which, however, gradually disappeared during the succeeding two months. During this time he had an increased and varying temperature. Aspiration of the tumor disclosed no pus.

2. A short time after recovery from this attack he experienced another of less intensity, which confined him to bed for six weeks. No tumor was noticed during this time.

3. One year after this he had a slight attack of one week's duration, and the outset of which was co-incident with an attack of indigestion.

4. From this time until the present attack (August 3, 1894) any intestinal disturbance was quickly followed by pain in the right side. Since the first attack (1888) the patient has suffered from constipation with attendant colicky pains.

5. The present attack began August 3, 1894, with pain and tenderness in the side, loss of appetite, and vomiting. For the next three days he attended to his military duties, although with much difficulty on account of pain and tenderness. The temperature was above normal during the last two days. He was sent from the state camp at Peekskill to St. Vincent's hospital, on August 11, 1894. At this time he had pain, tenderness, and tension of the right side, and a tender tumor was easily located just inside the anterior superior spine of the ilium. Rectal temperature 103 F., pulse 82, respiration 26 at this time.

The patient was subjected to operation August 12, 8:45 a. m., at which time the rectal temperature was 102½, and in all other respects the condition was similar to that of the preceding day. Before the operation I expressed the belief that the appendix, in this instance, was curled upward and outward below the caecum, the apex lying somewhere at the outer side of the caput coli. I ventured this prediction because of the fact that the entire painful induration was placed at the outer side of the caput coli, and also because the tension and tenderness were noted not only there but also above the iliac crest of the same side. During the course of the operation the following facts were demonstrated:

1. The contiguous parietal peritonaeum was adherent to the outer and upper surfaces of the caput coli.

2. Extensive induration was found at the inner side of the anterior superior spine of the ilium, extending upward and downward a considerable distance.

3. An abscess containing about two ounces of offensive pus was discovered at the posterior and outer surface of the caput coli.

4. The appendix could not be seen. Evidently it was confined in the mass of induration, and was no doubt perforated at or near the apex, and opened into the abscess cavity. The base of the appendix could, I am sure, have been located by following downward the fibrous band of the colon that leads to it; but the realisation of this proposition would have required the direct opening of the peritonaeal cavity through the peritonaeum mentioned already as adherent to the head of the colon. In view of the fact that it was deemed unwise to thus expose a healthy peritonaeum to the septic influences of the abscess close at hand, the

appendix was not disturbed. The abscess was drained through the loin, cleansed, and packed with iodoform gauze. The patient made a rapid and uneventful recovery. The induration disappeared quickly. At the present time the wound is nearly healed, and the patient complains only of the constipation, which dates from the time of the first attack.

It will be noticed at once that each of these cases is a secondary one, and therefore of special significance, since the afflicted have thus far escaped fatal termination. The first case sustained four attacks, the second two, the third and the fourth three each—twelve in all. Seven of these attacks were severe ones, confining the patients in bed from two weeks to two months. Six were slight, causing confinement of some four days to two weeks. The recorded intervals between attacks vary from five years to two weeks. Well marked fever attended the majority of attacks. The duration and degree of fever, however, could not be ascertained with sufficient certainty to be of reliable importance, except that of the fourth case, which was under the observation of Dr. Nelson Henry while at the state camp. Tumor was noted in six of the attacks. Pus was evacuated in the fourth case by operation, and found in the second in a caseous state during the operation. The appendix extended downwards and inwards in two instances. In one (third) it was five inches long and extended into the pelvis. In the first the diseased apex was adherent to the peritonaeum covering the brim of the pelvis. In the remaining cases it curved outward and upward below the caecum. In three fourths of the cases intestinal disturbances were pronounced as an initiatory symptom or probable exciting cause. Muco-pus was present in the appendix in two instances; a faecal concretion in one; in the other the appendix was not found. It appears to me that considerable importance can be attached to the fact that the tumor of the first case was moveable, comparatively near the pelvic brim, and easily defined, because these peculiarities indicate (1) a long mesentery of the appendix, (2) circumscribed tumor contiguous with intestinal folds, (3) an appendix within or near the pelvic brim; all of which

bespoke great danger to the patient from general peritonitis if rupture were to take place.

If these conclusions be true, then prompt operative action should follow the detection of a tumor having these peculiarities. If no tumor were found following a perforation of an appendix thus located, then, indeed, is the danger enhanced and all possible operative dispatch is demanded. The presence of the softened extremity of the appendix in this case, of itself, demanded operation, for obvious reasons.

Second Case.—In this the tumor was below the caecum, of small size, and pain occurred in the right thigh. These facts indicated that the appendix extended downward, and that the diseased action had involved the crural nerves. Although less dangerous than the former under unfavourable conditions, still easy general infection could quickly ensue from a perforation of appendix or of abscess in this situation. The dragging sensations of the right side which annoyed the patient before the operation disappeared after recovery. This suggests that they were caused by the adherent omentum that defined this case, the relief coming from the division and separation of it that was necessary to properly expose the caput coli.

Third Case.—No tumor was discernible in this case, but deep and long-standing tenderness and occasional pain called for operation here. The presence of the faecal concretion near the extremity of an ulcerating appendix, without the slightest external adhesions, emphasises the probability of subsequent sudden perforation, followed by pelvic inflammation, and a narrow escape from death.

Fourth Case.—The presence of the greatest pain, tension, tumor, and tenderness at and above the spine of the ilium in this case, indicated that the appendix turned outward and upward below the caecum, and extended above the spine at the outer side of the caput coli. The situation of the abscess at this point, together with the foetid pus it contained and its limitation on all sides at this situation, is confirmatory of the fact that the appendix was thus placed. It is fair to

assume that the environments of this appendix were such that the dangers from perforation, or from rupture of abscess, were reduced to a minimum. The long interval of time (over four years) between the last and the previous attack, emphasised the fact in no undoubted manner that one without operative relief is constantly menaced by this disease.

The appendices were tied about one half inch from the caecum, the end touched with cautery, and in two instances the tissues were turned inward by sewing. But recently I saw two other cases which resembled in the physical aspects the fourth of the series. Only one was a secondary case.

DISCUSSION.

Dr. E. D. Ferguson asked Dr. Bryant in what proportion of his operative cases suppuration was present.

Dr. Bryant replied that the majority of the cases that the surgeon was called to now were apt to be non-suppurative, but four or five years ago the majority of the cases had been suppurative. He could not give the actual percentage.

Dr. F. W. Goodall, delegate from Vermont, said he did not know that he cared to discuss appendicitis, for he knew some things about it which he hoped the others would never have occasion to learn. Only a few weeks ago he had read an article by Dr. Edebohls of New York, in which he claimed to feel the appendix in most cases. Since reading that article he had practiced this plan, and had been able to feel the appendix in a number of cases, and to note not only the existence or the absence of tenderness, but also the shape of the appendix. From this short experience it would seem to him that it was not difficult to feel the appendix by making a deep pressure near "McBurney's point." The examination was facilitated by sliding the skin near the spine of the ilium outward. On deep pressure the external iliac artery could be readily felt, and by following this vessel outward the appendix could be felt almost invariably as a round cord, or as a flattened band.

Dr. E. D. Ferguson said that he desired to know from Dr. Bryant whether upon diagnosticating appendicitis the operation was done at once, or whether he waited for some other surgical evidence—in other words, what were the principles which guided him at present as compared with his former practice.

Dr. J. G. Truax, of New York county, said that the description given in the paper of the four cases was so graphic that it could not leave doubt as to the propriety in operating in these particular cases. But he would

like to ask, if these four cases had been properly treated in the first instance, would they have been in the condition in which they were found? From his experience he would say that if the first attack of inflammation of the appendix or in its vicinity were properly treated subsequent attacks would not usually occur. What was the proper treatment? It was very simple—all that was needed was a little courage on the part of the physician to enforce it. The patient should be placed in bed, kept at rest, on a milk diet, and an ice-bag kept over the ileo-caecal region until there was no longer any induration at that part. Even after this the milk diet should be persisted in for two or three weeks, and then a farinaceous diet for five or six weeks more. If this treatment were followed he did not believe that in one case in a thousand there would be a second attack of appendicitis. He had treated a great many cases, and there had certainly been very few second attacks, although some of them had been under observation for eight or ten years. Of course, when the condition was like that found in Dr. Bryant's case at the time of operation, there was nothing to do but to operate. When the attacks became quite frequent it was best to operate in the interval.

Dr. H. O. Marcy, of Boston, Mass., said that the one question we most desired to have determined, and which was the most difficult of determination, was—when to operate. The doubtful cases could be illustrated by his last operative case. He had thought he was a conservative and not a radical, and he had said, "I will not operate upon this girl." His friend, Dr. Shattuck, being a medical man and not a surgeon, was asked to see the case in consultation. This gentleman really questioned whether there was an appendicitis. The case was again seen by them on the following day, and Dr. Shattuck was more than ever persuaded that no operation was necessary. Two days later there were chills and a rise of temperature, and exacerbation of all the symptoms, and the operation was immediately performed. He found a completely necrotic appendix. The symptoms had been probably masked by the fact that the appendix was turned behind the caecum. This was a fair illustration of the type of case which we were all likely to meet with. Now, what was an appendicitis? An appendicitis was definitely a proliferation of the bacillus coli communis, locked up in a small process of the bowel. If this were true were we to freeze them out with ice? No. Were we to accomplish anything by dosing, or be of the slightest service by any other means than by operation? These questions were pregnant with meaning, and involved matters of life and death. While the majority of cases might not require operation, he was inclined to go back to his old position as a radical, and say—"When in doubt, operate." In his experience, which had not been a small one, he had never felt sorry that he had operated, while he had like all others wrung his hands in sorrow because he had not operated. He believed that if we would be frank most of us would feel the same way. Was this waiting, Micawber fashion, "for something to turn up," a proper thing? Might we not operate with

safety and wisdom by operating early? In his experience he had never seen death follow any such operation, except where the disease had advanced beyond the appendix. He thought one or two per cent. covered all the risks of operative measures where the operation was done sufficiently early. The fatal cases were those in which the appendix had ruptured, and the bacilli had been disseminated through the abdominal cavity proper. In such cases, operation only brought surgery into disrepute, and the physician into sorrow and disgust. This had been his experience only a few days ago.

As to when we should operate in cases of recurring appendicitis, he would say that it seemed to be pretty well accepted now that it was best to do the operation in the interval between the attacks. He had been the first to operate according to this plan, and to his assistant at that time, the late Dr. Nelson, should be given the credit.

Dr. E. D. Ferguson said that as he had asked certain questions of Dr. Bryant, which were based somewhat on this general consideration of the subject, and as Dr. Marcy had alluded to the bacilli coli communis, he would like to say a few words. He had said one year ago in this place that the experience of individuals may differ very materially. He could understand very readily how Dr. Marcy and Dr. Bryant would see cases in which the great majority presented conditions demanding immediate interference; on the other hand he could understand how others, like himself, would see many cases which did not seem to justify operative interference. While the operation might not be frequently fatal, it was nevertheless true that with the average operator there would always be a certain percentage of mortality. Whether the operation was done with the unruptured appendix or ruptured appendix, there would be an appreciable amount of danger, and he was not certain that with the average operator the danger might not be greater in cases where the appendix had not been ruptured than where nature had shut off the region from the general abdominal cavity, as the latter seemed to involve only the danger attendant upon the use of an anaesthetic, in fact being practically only opening an abscess, unless a needless search be made for the appendix. If all our milder cases were to be operated upon, and the statistics were honestly collected, he was sure that there would be found quite a percentage of mortality associated with the operation. Did the surgeon of the present time take the position that we were to resort to operation speedily? He had been able to follow his cases of appendicitis pretty carefully, so that he was in a position to state whether there had been recurrences or fatal results, certainly in the greater portion of them, and his experience showed that the great majority of cases of appendicitis have terminated with a single attack. He believed that he had stated last year that in his experience he had seen about eighteen or twenty cases of well defined appendicitis each year, and that out of this number four or five of them would be cut; yet so far all of them had recovered, and the great majority of them would stay well. Whether or not his experience was peculiar, he could not say.

Dr. BRYANT, in closing the discussion, said he thought many of the instances mentioned by Dr. Ferguson might be accounted for by the fact that undoubtedly from sixty to eighty per cent. of cases having appendicitis primarily would recover without operation. The exact percentage had been variously estimated, and yet there could be little doubt about its general correctness. Secondary attacks occurred in from eleven to seventeen per cent. of the cases that had recovered from a first attack. Now, as to whether operation should be done, he could not say, and he did not know any one who could tell. The case presented in the paper, and of which he had exhibited the appendix, contained an enterolith, with an ulcerating surface around it. He could not say when it would ulcerate through. Again, in the case where the end of the appendix had been attached to the peritonaeum, covering the brim of the pelvis, the appendix had been in such a condition that he could not remove it without tearing it away. Such a condition, he claimed, was a very dangerous one, for it only required a sudden, violent movement to cause rupture of the appendix, and the discharge of its pultaceous contents into the abdominal cavity. If he had such an appendix as this he would immediately submit to operation, and he thought Dr. Truax would do the same thing. As no one could tell when such a condition existed, the question was, Was the patient in greater danger from the operation or from withholding the operation? The mortality had been correctly stated by Dr. Marcy—about two per cent. He believed in recurrent cases the best time to operate was in the interval. When there was a secondary attack he always advised an operation, but he did not know whether or not the appendix was still gangrenous. So long as this condition of uncertainty existed the patient was better off with his appendix out. The only cases in which he now refused to operate promptly were those, in which from long continued inflammation and extensive septic peritonitis, he would regard the operation as only serving to bring on a fatal issue. He had tried to palpate the appendix, but had not succeeded with that degree of certainty which had characterized the manipulations of Dr. Edebohls and Dr. Goodall. He had ceased palpating the appendix, (1) because he could not usually feel it; and (2) for fear he might rupture a gangrenous appendix. He would feel disposed to follow hard palpation of the appendix by prompt operation. Again the appendix assumes all sorts of positions; in some instances the intestines were loaded with faecal matter, and in others they were not; in some cases the abdominal walls were thin, in others they were thick; all these varying conditions were serious obstacles to obtaining any useful information by palpation of the appendix.

In conclusion, he would say that in an ordinary case of appendicitis in the primary attack, unless the symptoms called distinctly for operative interference, he would not operate; he would wait until such time that the fever indicated the possibility of pus—perhaps he would wait from thirty-six to forty-eight hours.

INTERESTING CASES FROM GENERAL PRACTICE ILLUSTRATING SPECIAL POINTS OF TREATMENT.

By Charles E. Lockwood, M. D., of New York County.

October 9, 1894.

In this age of realism, when the profession are seeking to refer diseases to specific causes and the revelations of the microscope are disclosing to us a vast unseen world of vegetable and animal parasitic organisms, which, by their number and association, are making it more and more difficult to assign to any specific one its role of causation, and when chemistry is constantly pointing out new ptomaines and leucomaines whose action in the production of physical derangement and disease is still undetermined, while atmospheric and climatic variations, hereditary influences, and individual peculiarities and environment are being investigated, it does not seem amiss that we should carefully study and report the cases which come under our observation as general practitioners, noting carefully such facts in the family and individual history as seem most important in the light of the increased knowledge of this century, in the hope that we may be able each to add his humble mite to the fund of knowledge which shall, in the future, make this world less full of trouble to man who is born of a woman, and whose days are few. Although parasites, ptomaines, leucomaines, and defective chemical action have been shown to be responsible for a large number of diseases and affections to which the human family is liable, it still remains to study the individual factor which may be more or less modified by premature or senile instability and decay, functional insufficiency and derangement of particular organs, defective chemical action, and lack of vital force in the great nerve centres,

and to point out that certain affections of the alimentary canal which were formerly supposed to be due to the gouty diathesis, are now known to be due to formation of ptomaines, due to fermentation caused by slow digestion incident on defective secretion due to lowered nerve tone, and which are now cured by the administration of intestinal anti-ferments, together with such measures as restore nerve tone.

My first group of cases includes five, which are especially of interest to the neurologist: one of tumor of the medulla oblongata; one of migraine; one of male hysteria; one of simple neurasthenia; and two of reflex neurasthenia, in which the peripheral irritation was supplied in one case by the eyes, and in the other by the genital organs.

The second group includes three: one of gonorrheal cystitis; one of gonorrheal proctitis, endometritis, salpingitis, and ovaritis; and a case of obesity with probably fatty heart, accompanied by dilatation and mitral insufficiency, complicated with bronchial catarrh and pulmonary oedema, and illustrating the efficacy of methods looking towards the unloading of the peripheral circulation of the kidneys and intestines, together with a cardiac tonic in relieving an overtaxed weak heart.

I give the history of these cases as they were taken at the time I saw them, leaving each case to speak for itself and carry its own lesson:

A Case of Male Hysteria.

A. B., aged 31 years; born in Scotland; occupation, a journalist; of neurotic temperament.

Family history.—Grandfather on father's side died of consumption, at 63 years of age. Grandmother on father's side died of catarrh of stomach, at 45 years of age. Father living, 84 years old. Was born when father was 53, and mother 45, years old. Has chronic bronchitis, emphysema, and tuberculosis, bacilli having been found on two examinations during the past year, and commencing cataracts in both eyes; of neurotic temperament and has undoubtedly a gouty diathesis, having been troubled with eczema, and oxalate of lime having been frequently found in his urine. Has been subject to attacks of asthma since 21 years of age; had specific trouble when 20 years of age, followed by secondary and tertiary symptoms. In 1880 and 1881 was worried about

family matters and had nervous attacks, accompanied with loss of consciousness, from which he was revived with difficulty. Says the attacks were not epileptic. One uncle died when young. One uncle, now living, is perfectly well, and another uncle, 62 years old, was said to have had consumption when young, but went to Australia and recovered.

I was asked to see this patient, as he had a nervous impediment in his speech, rendering his mode of conversation quite different from the usual form (probably hysterical stuttering). His father wrote me as follows: "From what he tells me the attacks must be epileptic, and the doctors who have seen him seem to have come to my conclusion that they are caused by some intestinal irritation. As in his present condition he is unfit to be out of doors, I told him I would ask you to call and see him at his house."

I accordingly visited the patient and obtained the following history: At 5 years of age patient had typhoid fever; at 7, scarlet fever; suffered much from pain in the back until 12 years of age; was in good health, except had dyspepsia. During preceding summer was very well. Rode the bicycle to excess; at times rode until he fell off the wheel exhausted; he also climbed cliffs. On October 2, 1891, he walked two miles, feeling unusually well; went to his office, had feelings of apprehension and heart pain; took a seat in a chair, and then he says all was blank. The next thing he remembers was that he was holding on a door-post and looking in the adjoining office. Was led to a chair by the typewriter. Head was clear, but he was unable to speak. Wrote in the dust on his desk the word "doctor." He was laid on the floor, and all movement in left leg and arm was lost. On the following day recovered motion in the arm, but leg dragged on walking for two weeks. His left leg was very weak afterwards, and he seemed to be obliged to make a great exertion to move the leg. He says he has had several such attacks, and that each attack has been followed by spasmodic asthma. In January, 1892, he over-exerted himself, became elated, and threw his hat in the air, when he fell down, and was unconscious for half an hour. In November, 1892, had slight attacks, characterized by a feeling of apprehension, and a sensation as though his heart was quivering from side to side like jelly. After these attacks his stomach was distended with gas, and he passed about two quarts of straw-coloured urine. At times, when sitting, he gets stiff, head falls back, mouth opens and remains rigidly open as though locked, is unable to speak, and has a fixed stare. Has had two or three such attacks in one day, and then no more for four days. He says he gets over an attack more quickly when he moves about and goes into the open air. He has had attacks at night and seemed unconscious for an hour or more. While relating these facts to me, he remarked that he was going to have an attack, and suddenly his face became red, his limbs stiff and rigid, pulse rapid and irregular, pupils dilated, mouth open, and gave utterance to a moaning cry; he was apparently unconscious for five minutes, when he recovered consciousness, and was unable to speak or move at first, but finally,

when a paper and pencil were placed before him, he wrote on the paper, "To sit up," and "That was a little one." He did not froth at the mouth nor bite his tongue, and he was not drowsy, although he stated that he had frothed at the mouth in other attacks, and was drowsy. He moved slowly after the attack. My diagnosis was male hysteria, and I prescribed bromide of soda, in 15 grain doses four times a day.

March 22, 1892.—Patient had an attack last evening at 9 p. m., the day after I saw him, which he says was accompanied by frothing at the mouth and drowsiness. March 30, 1892.—Has had no attacks since March 22d, and I now prescribed elixir of valerianate of ammonia, one teaspoonful three times a day; and two tablets of Flint's saline and ferric tonic, three times a day; together with 1-32 of a grain of bin iodide of mercury and 5 grains of iodide of potassium after meals. April 6, 1892.—Has had only one attack since last here, or two attacks in two weeks. He says he has never had these attacks when on the street, because he braces up. He states that his brain feels like a ball surrounded by a rind, and the brain wants to work, but the rind remains passive. He has hesitating speech to-day, but on some days speech remains clear. He has crying spells if he does not exert his self-control; has spasmodic asthma, can stop it by pinching his ear. Sometimes he says he sleeps well, but at times he wakes, and writes verses. Mixed treatment continued, also tonic in the shape of Fellow's hypophosphites. April 25, 1892.—Has had no spasms since last visit, but says he has had a desire to have attacks; has been irritable, and felt as though he wished to strike people. Has hesitating speech still. I prescribed 10 drops of tincture cannabis indica, and 15 grains of bromide of ammonium, every four hours. He had no further attacks after this, and I did not see him until May 10, 1893, one year afterward, when he called and stated that he had been well, except during the winter he had an attack after being excited, when he had suffered from pain in the heart and dragging of left leg for four days. Two weeks ago he had an attack of faintness and gnawing pain in the heart, followed by distension of the stomach with gas, and the passing of a large quantity of straw-coloured urine. I prescribed mixed treatment, a tonic, and elixir of valerianate of ammonia. In June, 1894, this patient called, and said he was suffering from a spasmodic affection of the throat, and while sitting in my office he had an attack, which seemed like spasmodic croup. He said he had an attack of measles, followed by bronchitis, during the winter, and had since been suffering from general debility. I diagnosticated the condition as hysterical, and prescribed elixir of valerianate of ammonia in teaspoonful doses three times a day, and as a tonic, syrup of hypophosphite of soda with tincture nux vomica and citrate ferri et quinine.

The interesting points in the case seem to me to be:

1. The gouty, neurotic, and specific history of ancestry, with tendency to tuberculosis, asthma, and eczema.

2. The instability of the nerve centres, due partly to faulty nutrition, produced by such dyscrasia.

3. The importance in such cases of urging a cessation of introspection, and the adoption of measures, looking towards such mental employment and diversion as will favour that end. The use of such means as will increase the control of the higher centres over the lower, and the avoidance of everything tending to mental and physical exhaustion.

4. The recovery under specific treatment, tonics, rest, and nutrition.

5. The question of the bearing of the advanced age of parents on the neurotic history of children, given birth to during that period, father of this patient having been born when his father was fifty-three years old, and mother was forty-five years old.

6. The influence of the cerebrum upon the bodily functions, it being probable that just as the cells of the spinal cord supply something which governs the nutrition of the body, so the cells of the cerebrum probably supply something, which perhaps has much to do with the proper and harmonious working of the various parts of the human machine, and inferentially the importance of methods of treatment directed to the intellectual faculties.

A Case of Simple Neurasthenia.

Miss B., born in the United States; aged 33 years; white; occupation, a housekeeper. Consulted me December 28, 1893. Family history shows that father died of rheumatism at 52 years of age. Mother living and well, 67 years old. Grandmother living, age, 89 years.

Patient says she suffered from nervous exhaustion five years ago, after beginning to keep house for her brother, who lost his wife. At the present time she complains that she is weak, has no appetite, suffers from flatulence, nausea, and a gnawing pain after eating. An examination of her urine showed acid reaction, specific gravity 1032, no albumen, no sugar. Under the microscope crystals of uric acid were discovered. Physical examination showed anaemic murmur at the base of the heart. I prescribed a diet of milk and lime water and kumyss, and 8 drops of tincture of nux vomica before meals, and pil. Blaud after meals. January 3, 1893.—Patient states that she was unable to retain the kumyss, or milk and lime water. She took six bottles of kumyss, all of which were vomited at once. I suggested the trial of peptonised milk in one half tumblerful

portions every two hours, alternating with Bovinine and sherry wine, and oatmeal well boiled, strained, then diluted with milk, and boiled again. Nux vomica and pil. Blaud continued. Advised sponging with cold water, and rubbing with hair mittens every morning to promote the activity of the cutaneous circulation and oxidation; exercise in the open air daily, short of fatigue, mental diversion.

January 17, 1894.—Patient was unable to take the peptonised milk, but has been able to take the oatmeal prepared as above, following it with one third the powder in one of Fairchild's peptonising tubes. She has also retained some beef and one dozen raw oysters daily, and has continued taking Bovinine in portions of two teaspoonfuls three times a day.

January 31, 1894.—Diet of oatmeal, milk, and Bovinine continued, but for three days past has taken chops, baked potatoes, and eggs, following each meal with a small dose of pepsin, bowels being regulated with a preparation of cascara, and tincture of nux vomica and Blaud pills continued, and from this time on patient made a complete recovery.

The points of interest in this case are:

1. The recognition of the anaemia and lowered nerve tone, and the successful treatment by nux vomica, iron, rest, and nourishment.

2. The idiosyncrasy in this case, allowing of the digestion of oatmeal gruel prepared with milk, and followed by a peptonising powder, when milk and lime water, koumiss, and peptonised milk were rejected.

Tumor of the Medulla Oblongata (probably Glioma).

M. M., woman; white; married; age, 25 years.

Family history.—Father living and in good health, 61 years of age; has followed the sea for thirty years. Mother died at 42 years of age from enlargement of the liver. Four brothers and two sisters living and well.

Personal history.—Has been married seven years; has had four children, no miscarriages. First child was born 11 months after marriage; second child, 19 months after the first; third child, 18 months after the second; fourth child, 17 months after the third. No history of syphilis in parents, husband, or self. Has never been ill before, except with diseases incident to childhood. Two of her children died in September, 1893, from diphtheria and measles, in consequence of which she suffered much from mental depression. In November, 1893, she began to suffer from pains in the back of the neck, and at the same time had heavy spells of coughing and sneezing, which have continued up to this date. Has had nystagmus in both eyes, which has now ceased. She also noticed difficulty in swallowing, and fluttering of the eyes. About four weeks ago she began to feel a weakness in the knees, as though she was about to double up. She is unable to stand for any length of time, or

maintain her balance while standing with the eyes shut. She also has tachycardia, the heart pulsations numbering 140. She walks with a staggering gait, and is constantly in fear of falling. She is not dizzy, but weak; dislikes to raise her hands to her head—prefers to let them hang down by her side; has creeping feeling under arms and on the sides of the body, and sore feeling in the ends of her fingers when she touches anything.

March 16, 1894.—Dr. Frederic Peterson saw the case, and thought she had a tumor of the vermis of the cerebellum, pressing on the medulla, and affecting the gloso-pharyngeal, pneumo-gastric, and other nerves.

April 10, 1894.—Dr. M. Allen Starr was of the opinion that this patient had a tumor of the medulla, causing all her symptoms; probably a glioma. He found anaesthesia of the pharynx and larynx, with choked discs, and commencing amaurosis. Suggested that the patient remain quietly at home, use morphine in doses of 1-8 of a grain for headache, and atropia 1-120 grain and strychnia 1-40 grain as a heart tonic.

May 22, 1894.—Patient's condition unchanged. The points of interest in this case are the diagnostic value of such symptoms as pain in the back of the neck, nystagmus, coughing, sneezing, difficulty in swallowing, anaesthesia of the pharynx and larynx, choked disc, general paraesthesia and anaesthesia, staggering gait as indicating involvement of the glosso-pharyngeal, pneumo-gastric, and other nerves, and pointing to the medulla as the seat of morbid growth.

A Case of Migraine, and its Palliative Treatment by Cannabis Indica, Bromides, and Arsenic.

M. S., woman; white; born in Germany; age, 41; married; temperament neurotic.

Family history.—Father died at 69 years of age. Cause of death, as given by patient, "Asthma." Mother died at the age of 52. Cause of her death, "change of life." One brother and one sister, 50 and 45 years of age respectively, living and well.

Personal history.—Patient states that she menstruates regularly once a month, but generally suffers from headache before or after; that she has suffered from headaches for the past ten years; that she now has them twice a week; and that they came on originally after sweeping, with the windows open, on a wet day. She thinks she suffers more from them in the winter than in the summer. Eyes and nose ache and run water when she has a headache, and she also suffers from nausea. Precursory symptoms are coldness, dryness, and itching sensation of the nose. She has had one child, now 23 years of age; no miscarriages, and has never been seriously ill. Examination of the uterus shows tenderness back of the cervix, and that the womb is bound down by old adhesions, the result of peri-uterine inflammation. Examination of the urine shows nothing abnormal except a deposit of triple phosphates.

Treatment was begun January 6, 1892, by the administration of Herring's extract of cannabis indica, 1-6 of a grain three times a day, before

meals, with directions to increase the dose weekly by 1-6 of a grain until 3-6 were taken, or some unfavourable symptoms were produced by its action, such as light-headedness, drowsiness, or dreamy state; and 1-50 grain of arsenious acid after meals. Her eyes were examined by an oculist, and some defects found, for which proper glasses were prescribed. The above mentioned measures constituted the inter-paroxysmal treatment, and during the attacks and in the endeavour to ward them off antipyrine and caffeine were used, but unsuccessfully for the most part, it being necessary to use a hypodermic of morphine to control the attacks—which seemed to me to be justified in this case, as long as the attacks were not very frequent and no tendency to the morphine habit was developed. A hypodermic injection of crystallised hyoscyamine 1-50 grain has been advised to control the attacks, but this I have not used. Under the treatment the patient improved so that on February 6, 1892, one month after commencement of treatment, the interval between the attacks had been increased to two weeks. On March 7, 1892, the interval between the attacks of headache had been lengthened to three weeks, and from this time on, for the next two years, the attacks were so infrequent that I was not consulted. On March 19, 1894, however, the patient called and said she was again suffering from the headaches, which came on weekly. Extract of cannabis indica was again prescribed, with 1-50 grain of arsenious acid three times a day. Three 5-grain Blaud pills after meals, and 20 grains of sodium bromide at 4 p. m. and at bed-time. On May 16, 1894, the patient had had no return of the headache for four weeks. She is now taking two pills of 1-6 of a grain of extract of cannabis indica three times a day, which she has been advised to continue for many months, and 1-50 grain of arsenious acid with iron, the bromide having been discontinued.

The points of interest are,—

1. The difficulty of ascertaining the exact cause of the attacks of migraine, which might furnish clear indications for the treatment.

2. The value of the palliative treatment by means of cannabis indica, arsenic, iron, and bromides.

3. The importance of the consideration of uric acid as a factor in the causation of migraine, as suggested by the investigation and results brought forward by Dr. Alexander Haig, of London, who on a diet of milk, fresh fruit, and vegetables diminished the frequency of headaches in his own person, from an average of one in a week to an interval of eighteen months.

A Case of Reflex Neurasthenia due to Stricture of the Urethra, of Large Calibre, one eighth of an inch from the Meatus Urinarius.—Free Division of the Stricture followed by Complete Recovery.

E. T. R., man, white; age, 32 years; born in the United States; occupation, a fisherman; weight, 155 pounds; consulted me December 29, 1892.

Family history.—Father, age 60, living and in good health; mother, age 62, living and well. Has two brothers, who are also in good health. Father has suffered from rheumatism, and one sister and brother of his mother died from phthisis.

Personal history.—No history of gout nor rheumatism. Had chills and fever sixteen years ago. Had influenza three or four years ago. No sequela. Has been married six or seven years; has two children, girls, 6 and 4 years of age. Wife is 24 years old, and in good health. He says he has never had any venereal disease whatever. Masturbated when young, but not very much. Some years ago he used to notice that when he wished to urinate he could not, and, as he expressed it, "would put up." In October, 1892, he began to feel a slight irritation, something like a sensation of heat, in the head of the penis, and thinks he had a slight gleety discharge at that time. He also noticed that the urethra did not empty itself completely. He says he tore the fraenum when young in trying to enter a woman, but was unable to effect an entrance. Has had an uncomfortable feeling in the rectum while sitting. About November 15, 1892, he was scarcely able to walk at night, owing to weakness of the legs below the knees. He also had a feeling of weakness in the forearms, hands, and fingers, and slight pain in one foot. Was also troubled in reading; in the day-time he had to hold the newspaper at a greater distance than usual from the eyes, but at night he was unable to read at all. He says he now reads as well as ever. He had at the same time what he called spasms, which seemed to go from his head to the head of his penis. These came on, he says, while dozing. Complains that his brain is muddled after sexual intercourse; that he has queer feelings in his hips, which he describes as pain, weight, and bearing down. Urine examined; specific gravity 1030, no sugar, no albumen. Phosphates found under the microscope. An examination of his urethra showed stricture admitting No. 17 bulb American scale, 1-8 of an inch from the meatus urinarius. The stricture was incised freely so as to admit No. 22 bulb, American scale.

January 3, 1893.—Passed No. 22 short sound through the meatus, and No. 15 sound into the bladder. Patient went home, having been instructed to pass No. 22 or No. 18 conical short sound through the meatus every fourth day for a week, and once a week thereafter for a month.

March 12, 1893.—Patient writes me from his home that he has gained 25 pounds since the operation, and that all his unpleasant symptoms have disappeared.

It seems to me of interest to note in this case the annoying train of nervous symptoms produced by a slight stricture of the meatus urinarius, and their complete and permanent removal by free division of the stricture and subsequent dilatation during the process of healing.

A Case of Reflex Neurasthenia, due to Neurotic Temperament, Struma, Anaemia, and In-Door Confinement, Complicated with Myopia and Weakening of the Internal Recti and Right Superior Rectus Muscles of the Eyes.

P. W., age 17 years; white; born in New York.

Family history.—Father living, age 38 years, neurotic temperament and strumos. Mother living, age 37 years, neurotic temperament, gouty, given to introspection and general apprehension that she was suffering from cancer.

Personal history.—Patient has never had rheumatic fever; has always been very nervous, but has never had any prolonged illness. During his early years he suffered from enlargement of the tonsils and their frequent inflammation; also from balanitis, for which he was circumcised. In 1887 he suffered from a number of nervous symptoms, which seemed to me at the time to be due to debility, or general mal-nutrition, such as a sensation of tickling down the chest, numb feeling in one half of right hand, chills in the head, as he expressed it, and a feeling as though tipsy when walking. Improvement followed tonic treatment.

In 1891, during the winter, he was found to be anaemic, murmurs being heard at the base of the heart and root of the neck. At the same time he had frequent nocturnal emissions. Improved under iron and giving up attendance at school. Returning to his studies too soon, without my approval, in the spring of 1891 he began to suffer from vertigo. He was somewhat better on going to the country during the summer of 1891, but still had vertigo at times. In the fall of 1891, on his return to the city, he was compelled to go to school under threats of being deprived of pocket-money and theatres, also disinheritance, if he did not go. He then began to complain of vertigo, a feeling as though the floor was like dough, and as though his foot was entering a hole in the ground. The bed seemed to be moving, chairs and doors tottering, earth moving away from his feet. Cold, clammy feet and hands, rush of blood to the head, feeling of rising in the throat and pain, hot and cold flushes in different parts of the body, and a feeling as though he was going to faint on the street; a sensation as though he was going to explode when sitting in a chair unless he got up. At this juncture, Dr. Janeway saw the case with me, and advised leaving off study, out-door life, and an examination of the eyes.

February 24, 1892.—Dr. C. S. Bull made an examination of his eyes, and found the following condition: "The right eye is slightly myopic,

with slightly sub-normal vision. The left eye is more highly myopic, but the vision, when the error is corrected, is perfectly normal. The muscular condition of the eyes is far from satisfactory. There is a loss of power in the right superior rectus muscle, and in both internal recti muscles. These anomalies are not proper subjects for operation, but may be corrected and improved by proper prismatic glasses. I have given him the formula for proper glasses—one pair for reading and writing, and one pair for the street and places of amusement. While I think there is no reason for stopping his studies, they should be so directed and limited that he should not need to use his eyes more than half an hour at a time. In choosing a business or profession, care should be taken to avoid such occupation as would keep him confined to his desk for hours."

February 6, 1893.—Patient better since eyes were attended to, but still gets very tired on exertion, and totters, as he expresses it; has only walked in sight of the house where he lives for a week, as he feels weak and gets shortness of breath and becomes dizzy; symptoms of last year are not present; cannot ride horseback or go out in a carriage alone, as he seems to be afraid to do so. Examination of urine showed oxalate of lime.

May 7, 1894.—Patient has lived in the country on Long Island, New York, since June, 1893, one year, and is better in all respects; but I still find his nervous system in a very unstable condition, and still advise a life in the open air in the country, and freedom from all mental and physical strain.

The points of interest in this case are:

1. The general mal-nutrition, and instability of the nervous system, due probably to strong hereditary tendency; strumous and gouty dyscrasia, and the evil effects, in such cases, following close application of the mental faculties, and indoor confinement.

2. The ocular defects, probably due to mal-nutrition, and the reaction of such defects upon the over-sensitive nerve centres, as shown in this case by a great variety of morbid sensations, probably due to instability of the vaso motor system of nerves.

3. The relief of the unpleasant nervous symptoms in this case by the wearing of proper glasses, without cutting the eye muscles, and thus avoiding another source of nervous irritation, which I think the frequent operation sometimes does produce.

A Case of Gonorrheal Cystitis: Treatment by Washing out the Bladder with Solutions of Boracic Acid and Borax in Glycerin and Warm Water, and the Administration of Diuretics, Antiseptics, Diluents, and Tonics, Followed by Cure.

C. A., colored, aged 34 years; born in Nashville, Tenn.

Family history.—Father died of phthisis at about 40 years of age, and two brothers suffer from lung trouble.

Personal history.—Has had gonorrhea two or three times, it having lasted in one instance for three years; has had stricture of the urethra, for which internal urethrotomy was performed. Had primary syphilis in 1880, and has had outbreaks of specific symptoms up to the present time, for which he has been treated intermittently; had intermittent fever at 10 years of age, pneumonia in 1876, and pleurisy in 1879. Patient has been under my care since 1888, up to the present, during which period he has received considerable treatment on different occasions for rheumatism, syphilis, pleurisy, and minor ailments. On December 23, 1893, he called on me and said that he wished to be examined to ascertain if he was suffering from stricture of the urethra, as he had had some discharge from urethra, and had been using various injections without favorable result. Thinking he might be suffering from discharge due to congestion of a damaged urethra, behind a stricture, and he giving no history of a fresh gonorrheal attack, I passed a No. 15 bulbous bougie into the bladder and met with no obstruction. My patient seemed satisfied and left my office. On December 28, however, he called again, and now complained of great frequency in passing water, accompanied with tenesmus and pain. I advised that he should go to bed, apply hot poultices over the hypogastrium, take 30 grains of citrate of potash, well diluted with water three times a day, and to allay the vesical irritability, use a suppository of one grain of extract of hyoscyamus, and one third grain of aqueous extract of opium, every three hours. An examination of his urine showed a large quantity of mucus and pus.

Dec. 29, 30, and 31.—Same treatment continued, with rest in bed, but the distressing symptoms not having abated, and the urine being still loaded with mucus and pus, on June 1, 2, 3, and 4, 1894, I washed out his bladder with a solution of boracic acid in warm water, one teaspoonful to the pint, by means of a glass funnel with a rubber tube attached, connecting with a flexible No. 7 rubber catheter, not more than four ounces being allowed to run into the bladder at each application, a funnel being held at a height of not more than two feet above the fundus of the bladder.

January 17.—Bladder symptoms somewhat improved under previous treatment, but still has frequent calls to pass water, and the urine contains mucus and pus. Patient was now allowed to leave his bed and go about, and on calling at my office, after passing his urine, I passed a catheter to ascertain whether there was any residual urine, and found none. A rectal examination showed the prostate to be swollen and ten-

der. I then washed out the bladder with a solution of borax in warm water, two teaspoonfuls to four ounces, and ordered him to take one ounce of infusion of buchu with five grains of benzoate of soda, three times a day, as a diuretic and anti-fermentative; to drink freely a tea made of green parsley as a diluent, and ten drops of the muriated tincture of iron three times a day as a tonic. This treatment was continued, washing out the bladder twice a week with the last mentioned solution, to which a little glycerin was added, until January 27, when the symptoms yielded, urine clearing up, and the patient recovered completely.

The points of interest in this case are:

1. The probability of this patient having contracted a gonorrhea, which he had aggravated by irritant injections, when he first consulted me, and the importance of bearing such fact in mind on being consulted in such cases, before passing instruments into the bladder, which might carry infection, patient having misled me when he called, by asking to be examined for stricture.

2. The importance of examining the discharge in such a case, as to the presence of the gonococcus.

3. The curative effects of washing the bladder, not too frequently, with borax and warm water; twice or three times a week seeming to be sufficient, so as to avoid too much mechanical irritation, combined with the diuretic and anti-fermentative effects of buchu and benzoate of soda, the diluent qualities of parsley tea, and the tonic properties of the muriated tincture of iron.

4. In another case I should try the effects of the internal administration of methyl blue, in capsules, beginning with a dose of one half a grain, three times a day, as an anti-ferment.

A Case of Gonorrheal Proctitis, Endo-Metritis, Salpingitis, and Ovaritis.

L. K., woman; white; age, 24 years; consulted me January 8, 1892, complaining of uneasy feelings and pain, and discharge of mucus from the rectum. I was led to suspect the existence of gonorrhea, from the fact that her husband was at this time under my treatment, suffering from gonorrhea, who stated that he had recently returned from a railroad trip, and while away had intercourse with a suspicious party, and that on his return home, after seeing his wife, he had noticed a discharge. However, patient made no complaint of ardor urinae, and a

careful examination at this time failed to show any discharge from the urethra, vagina, or cervix-uteri. An examination of the anus showed it to be inflamed and fissured, and wishing to avoid unpleasant family complications, I endeavoured to make light of the matter, and touched the fissures with solid stick of nitrate of silver, which seemed to give some relief. As the examinations were very painful and disagreeable to the patient, she did not call on me again until January 28, when she still complained of discharge of mucus from the rectum, for which I now prescribed rectal injections of borax and warm water, and suppositories of tannin, 5 grains each. Another careful examination showed no discharge from the urethra, vagina, nor cervix-uteri. I heard nothing further from the patient until February 14, 1892 (seventeen days after her visit to my office, and thirty-seven days from the date of the commencement of her illness), when I was asked to see her, and found her still discharging mucus from the rectum. I also now found the cervix-uteri red, inflamed, and eroded, and a large plug of yellow mucus hanging from the external os. There was great tenderness on pressure in the posterior cul de sac of the vagina, and examination by the rectum revealed a small movable body about the size of an English walnut posterior to the cervix-uteri, a swollen and prolapsed ovary, and to the left and somewhat posterior to the body of the womb, a movable mass which felt like a collection of pus, and by which the body of the uterus had been pushed over towards the right. A diagnosis was now made of gonorrheal endo-metritis, salpingitis, and ovaritis, and rest in bed advised, with application every other day of tampons of cotton to the cervix-uteri, saturated with a mixture of ichthyol and glycerin, 2 drachms to 4 ounces, iron, and abundance of nourishing food. Tampons were used every other day, until March 4, when menses came on and vagina was cleansed every other day with warm carbolated injections. On March 12, period having ceased, the tampons were resumed, and continued at longer intervals until April 16, when there being no discharge evident from cervix, urethra, vagina, or rectum, patient was discharged apparently cured, and up to date of this writing there has been no further complaint.

The points of interest in this case are,—

1. The gonorrhea of the rectum, which attracted attention when there were no symptoms of gonorrheal inflammation of the urethra, vagina, or cervix-uteri apparent.

2. The supervention of endo-metritis, salpingitis, and ovaritis about one month after the appearance of the rectal discharge.

3. The efficiency of ichthyol and glycerin tampons in curing the disease, without recourse to operative measures.

4. The necessity of looking beyond the vagina for evi-

dences of gonorrhea, as, according to Bumm, it is rare for the disease to begin in the vagina, usually showing first in cervix-uteri or urethra.

A Case of Obesity with probably Fatty Heart, Accompanied by Dilation and Mitral Insufficiency Complicated with Bronchial Catarrh and Pulmonary Oedema.

E. R., woman; white; age, 40; born in Ireland; weight, 200 pounds; began to grow fleshy at 24 years of age, and has been increasing in flesh since.

Family history.—Good.

I saw her first on November 11, 1892, when she had been ill for ten days and confined to her bed, and found her sitting up in a chair and greatly troubled with fits of coughing, wheezing, and dyspnoea, so that she feared she would suffocate, and complaining of great soreness in right side, probably muscular, due to violent fits of coughing. Her face wore an anxious expression. Pulse, 132 to the minute, and auscultation showed mucus and sibilant râles over the whole chest. The area of dulness in the cardiac region was found enlarged beyond the normal, but I was unable at this time to detect any murmur, it probably being masked by the râles in the lungs. A diagnosis was made of bronchial catarrh and pulmonary oedema, and dry cups were applied over the chest in front, which seemed to give some relief. On the next day, however, patient seemed to grow worse, and a careful examination revealed a blowing murmur most distinctly heard at the apex of the heart. Dr. R. C. M. Page saw the case with me on this occasion, confirmed the diagnosis, and advised the giving of a pill of one grain each of calomel and digitalis and powdered squill every two or three hours until purged; and to act on the kidneys and tone up the heart muscle, 15 grains acetate of potash and a tablespoonful of infusion of digitalis every two hours, with the result that on November 16, the râles and murmur had disappeared, and patient was convalescent. Under suitable after-treatment for the obesity, and a heart tonic, patient ultimately fully recovered her health. I should add that a careful examination of her urine was made, and nothing abnormal found.

The point of interest in this case was the relief afforded an over-taxed weak heart by cathartics and diuretics, unloading the peripheral circulation of the intestines and kidneys, combined with a heart-tonic.

A CASE OF ANAESTHESIA WITH DEATH, AND ATTEMPTED EXTORTION SUCCESSFULLY RESISTED.

By Eden V. Delphey, M. D., of New York County.

October 9, 1894.

Among the many trials, troubles, and tribulations of members of our profession, is the one wherein some designing and unscrupulous person thinks he sees a short road to wealth by mulcting the family physician in suit for damages.

Having recently, with a brother practitioner, been the victim of such an attempt, having together successfully resisted the attempts at extortion in a court of law, and being informed that no case of this kind and character has ever occurred in this state, we think it best that a statement of the facts be placed on record.

On February 13, 1892, Dr. A. H. Goelet of this city asked me to go with him to see a patient and perhaps to give an anaesthetic for the purpose of amputating a gangrenous finger. On arriving at the patient's residence and after removing the dressing we agreed that it would be inopportune to operate at that time. On the 19th of March, following, while calling at the doctor's office, the patient came in and together we discussed the operation which was set for the following day, on which day, the 20th, we went to the patient's residence, began to give the anaesthetic, and the patient died. Inasmuch as the facts and circumstances relating to the administration of the anaesthetic, the attempts at resuscitation, etc., were brought out in the suit for damages, and are clearly and concisely stated in the hypothetical question, attorney's address, and judge's charge, they will be recounted later in that manner.

A few days after this unfortunate occurrence, we were each visited by a representative of a so-called "Society for

Protection from Personal Injury," who stated that a suit was about to be begun and tried to induce us to compromise the case, but knowing we had done no wrong, regretting the misfortune as much as any one, and having the welfare of other members of the profession at heart as well as our own, we declined to do so. Some little time later we were again visited by another representative, who was very arrogant and abusive in his endeavour to extort money.

The trial, after many days, finally began in the supreme court before Judge Truax, on Tuesday, April 24, 1894, and ended Friday, April 27, 1894, the jury bringing in a verdict in our favour.

The experts for the defense were: T. Gaillard Thomas, William T. Bull, Robert Abbe, J. West Roosevelt, Herman J. Boldt, Edwin B. Cragin, Ferd. C. Valentine, and the hypothetical question was as follows:

HYPOTHETICAL QUESTION.

Q. Assume that a patient of about fifty-two or fifty-three years of age had gotten a splinter in the forefinger of his right hand; that it affected the bone, that gangrene set in, that he had septic symptoms; that he went to a physician's office one evening to have his hand dressed and on examining it the physician found that the bone could be taken out without giving an anaesthetic but he said he would not be able to bear the pain of it without an anaesthetic, that the physician made an examination of his heart, his lungs, and his urine and found that they were normal; that the physician attended with an assistant who was accustomed to give anaesthetics to perform an operation of amputating the diseased finger; that while the physician was preparing his instruments the patient remarked: "Doctor, you are not going to give me chloroform are you?" and the physician told him he would give him chloroform only in the beginning as he would need less of the anaesthetic; that the patient said nothing more; that the assistant also made an examination of his heart and lungs and was present and watched the physician when he made an examination of the patient's urine and coincided with his opinion of the results found by such examination and that urine contained neither albumen nor sugar, and was normal. That the assistant asked the physician if he should commence with chloroform and the physician said "yes," and that then the patient was lying on the bed partially undressed prepared for the operation; that chloroform was administered by means of an Esmarch inhaler, and that the chloroform

was dropped drop by drop on the inhaler from above; that about a half and not more than a fluid dram was used; that during the inhalation of the chloroform the patient began to resist and threw his arms about the bed; that the physician sat on the side of the bed and took hold of the wrist of the sore hand so he would not injure it; when he became quiet the physician turned away to prepare his instruments and while doing so he heard the patient breathing stertorously, that chloroform was laid aside for about one to two minutes until there were signs of returning consciousness and the stertorous breathing had changed to quiet and normal breathing. That ether was then substituted for chloroform and administered by means of a cone made of folding paper and towel, that shortly after the assistant asked the physician to help him, saying that the patient had stopped breathing. That the physician went quickly to the opposite side of the bed and with the assistance of another person in the room elevated the patient's feet and suspended his head and shoulders over the side of the bed, so that the assistant could make efforts at artificial respiration. That the assistant worked on the patient to produce artificial respiration, by the assistant grasping him by the elbows, pressing them forcibly against the chest, then extending them over the head pretty well back, and repeating this performance about twenty times a minute for about half an hour but without avail, that only after the heart had ceased to beat were efforts to resuscitate discontinued.

Now, in your opinion, did or did not the physician and his attendant or assistant use the proper and usual course adopted by physicians and surgeons in such cases?

A. Yes.

Assuming the same state of facts, did or did not the physician and his attendant or assistant, practice and observe the usual methods generally and ordinarily adopted by physicians and surgeons in such cases?

A. Yes.

Assuming the same state of facts, did or did not the physician and his attendant or assistant practice and observe the usual methods generally and ordinarily adopted by physicians and surgeons skilled in performing such operations?

A. Yes.

Assuming the same state of facts, did or did not the physician and his attendant or assistant practice and use the care and skill ordinarily used and employed by skilled physicians and surgeons in administering the chloroform or ether?

A. Yes.

Assuming the same state of facts, in your opinion, had or had not the physicians committed malpractice?

A. Certainly not.

The attorney for the defense was Albert C. Aubery of this city, and after thanking the judge for his fair decisions and the jury for their patient attention, reminding them that his honour was judge of the law and they were sole judge of the facts, and that their responsibility was no light one, as on their decision hung the future professional hopes and prosperity of the defendants, he said,—

Now, gentlemen, what is this action? By whom is it brought? Against whom is it brought? And what will be the result of your decision? These are questions to which I propose to call your attention, requesting the same degree of attention on your part to what I may say, that you have already given to this case.

This action, gentlemen, is to recover the sum of $5,000 from the defendants by the plaintiff for alleged malpractice.

The plaintiff is the widow and the administratrix of M. L., deceased. She sues as such administratrix, under the statute of the state of New York, claiming that amount of damages—mark you, gentlemen, damages!—for wrongfully causing the death of her husband. She claims that the defendants administered to her husband chloroform, a deadly anaesthetic, in their capacity and occupation as physicians and surgeons, so negligently and unskilfully as to cause his death, thus depriving her and her children of their only support. She also claims that chloroform was administered to her husband by the defendants contrary to her husband's expressed request, and contrary to her request and that of their children. The husband of this plaintiff was afflicted with gangrene of the forefinger of his right hand. The finger was to be amputated. The defendants were employed to perform the operation. They deny all charges of negligence, or of other improper conduct. I think, gentlemen, you will agree with me that I have made a fair statement of the case and by whom it is brought.

As to the question against whom it is brought, you, gentlemen of the jury, have seen them here. Ever since this case has been on trial—now its fourth day—the defendants have been in court, their future professional reputation dependent upon your decision. They fear not the result, for they conscientiously feel that there is not a man on this jury who will not decide this case under the solemn oath he took, when he was sworn as a juror, to render a true verdict upon the evidence.

After referring to the positions of the defendants in the community, he continued,—

This suit, gentlemen, is not brought against a branch or limb of the medical and surgical profession, but against the root and tree of that

honoured profession. It is a blow struck at its very foundation. A blow which, if you shall hold is well aimed by your verdict for the plaintiff in any sum, however small, means a deadly blow to that profession. But I believe better things of you. I have in you full confidence that you will render a verdict which will send both of these defendants back to the bosom of their respective families now anxiously waiting their return, to gladden not only their hearts, but one which will be flashed over the electric wires, binding state to state as one common brotherhood, to every medical society in this country, that these defendants are not guilty of malpractice: that they are not malpractitioners.

What profession, gentlemen, is more honoured than the medical? I know of none. The physician comes nearer to the bosom of your family and life than any other of the learned professions. While the minister and the lawyer in turn have their arduous work and duties, yet the medical profession is the one you look to so that you may have a clear head and perfectly healthy body for your daily labours. It is he who holds the secrets of your life. Your physician, in order to carefully administer to your every want and need in time of sickness, should know your whole system and life from the cradle. It is to him you reveal your whole life and deeds so he may judge how properly to relieve your sufferings so you may attend to your daily duties; and in your last hours on earth he is often found to be the best comforter and sympathiser with those whom you may leave to mourn. What profession is more noble!

Gentlemen, there is more at interest here than if this were an action for debt. These defendants are not in debt to this plaintiff. They do not owe her a cent, and although this suit is one to recover money damages, the effect of a judgment for any sum against these defendants is far-reaching and significant. It means that they have been careless, negligent, unskilful, and untrustworthy in their professional conduct. This is the charge. Their professional reputation is attacked! This is a suit for malpractice, gentlemen: do not forget that! Now what is malpractice? Let us see if the charge has been established, and if these defendants are malpractitioners. Malpractice is an improper discharge of professional duties, either through want of skill or negligence. In other words, it is negligence. That is a fair definition. Being an action for malpractice, it is one in tort, as we lawyers say. Now the medical man holds himself out to the public, that he possesses the ordinary skill requisite for reasonable success, and that he will attend to the case put in his charge with due care. Hence negligence in the medical man is a violation of the obligation that he impliedly enters into when he accepts charge of a patient, which obligation enjoins care and caution in what he does and what he omits to do.

He then explained that the burden of proof rested with

the plaintiff, and commenting on the evidence and the results of the autopsy, which were "pulmonary oedema, pachymeningitis, old adhesion of lungs on left side, kidneys show some changes, gangrene of the first finger of the right hand," said,—

You will remember that the plaintiff's case was hanging by a hair, and it was only because I saw the trial was about to terminate by the withdrawal of a juror, resulting in a mis-trial, that I consented, in order that these defendants should have an opportunity to be heard, to admit that if Dr. Walsh, who made the autopsy, and who is at present on the high seas, was in court, he would testify that the autopsy disclosed just what I have stated to you.

And then, gentlemen, having claimed to have established that fact, came the most remarkable exhibition of ignorance of a person calling himself a physician ever witnessed in a court of justice. On behalf of the plaintiff, a Dr. ——— was called on to give expert evidence. He said he resided at ——— avenue, in this city. He said he graduated from the University at Vienna; that he came to this country in 1875, and graduated in 1884 from ——— college in Chicago. In answer to a question of the plaintiff's counsel, he testified that no conscientious physician would administer chloroform to a patient having incipient disease of the kidneys. This was the counsel's climax. The height of this case had then been reached. The witness submitted most unwillingly to cross-examination. You will remember how I asked him question after question as to what effect chloroform would have upon the human system. Many books of standard medical authority—books which he was compelled to admit were standard authorities, whether he had ever seen them or not—were read to him, paragraph after paragraph, wherein all the authors had written and asserted exactly the opposite of what he had testified to. The only way in which he could crawl from the ridiculous position which he had assumed, was to say, "I do n't agree with the author." He put himself up as authority against them all. Yet he had to admit, although he had held the position of a coroner of some obscure place out in the western part of this country, that he has had deaths in his practice while he administered anaesthetics. What could be his defense in case a suit for malpractice should be brought against him, when all the standard medical authorities would be read in evidence, as against the method he had adopted or the remedies he had used? I confess I do not know. I fear he would have to throw himself on the mercy of his accusers, and beg. Contrast him, as a witness, and his testimony with all the standard medical authorities here produced; contrast him and his testimony with the high character and reputation,

city, state, and national, of Drs. T. Gaillard Thomas, William T. Bull, Robert Abbe, J. West Roosevelt, Herman J. Boldt, Edwin B. Cragin, and Ferd. C. Valentine, called to the witness stand by the defendants—witnesses whose very words, thoughts, and advice are sought after by the learned of the medical profession. What did those eminent medical college instructors and hospital surgeons say? You, gentlemen, have heard how they have ridiculed him. Not one agreed with him—not one. Some simply said, "No," when asked if they agreed with him; others said, "It was absurd." I challenge the plaintiff's counsel to produce another man of any medical knowledge who will testify that he agrees with him. He said no conscientious physician would give chloroform to a patient who had any kidney disease. The authorities read to you and the witnesses said, "Do not give ether." Would you, or any reputable physician, believe ——— and give ether, when all the authorities tell you in plain words not to give ether, but affirmatively say to give chloroform? I will admit doctors do not always agree. It is not natural that they should. Some physicians will give chloroform in any case. Some will give ether in any case. The evidence has demonstrated that; but not a single expert witness testified that he should not give chloroform when the patient had any kidney disease. I think I can fairly dismiss ——— as a witness in whose testimony you can place no degree of confidence or credit.

Now, gentlemen, what more did those eminent physicians and surgeons—men of national reputation—testify to? You will remember the long, hypothetical statement reciting all the facts proved in the case and the questions which followed it. All the witnesses—yes, all, not a difference between any one—testified that the defendants were not malpractitioners, that they followed the best practice, and used all the care that could be used. They followed the usual course skilled physicians and surgeons follow in such cases; that they were not negligent in their practice in any respect; that their treatment was proper in every respect; and they all approved of etherisation by beginning with chloroform.

Now, gentlemen, we will turn our thoughts to the family deprived so suddenly of its head. Mr. M. L. had a gangrenous finger. The defendant, Dr. Goelet, was his family physician, and on March 20, 1892, attended to amputate the finger with Dr. Delphey, who was to administer the anaesthetic. An examination of Mr. L., the patient, as you have heard testified, was made in the usual way and manner the day just prior to that set for the operation. Under the anaesthetic agent he died. The defendants deplored and greatly regretted the death. It was an accident, an unforeseen and unexpected event which no finite being had any reason to expect. The event is greatly to be regretted by all. But, gentlemen, this is not a case of charity. No one would be more liberal to aid and assist the afflicted family in case of need than their family

physician. But when that trusted, competent, and skilful family physician and his able assistant are attacked unjustly for malpractice, and proclaimed to the world to be malpractitioners, there was no other course left for them but to defend themselves, their honour, their integrity, their ability, their life-long study, their professional reputation. That is what is at stake in this action.

There is an element in this case to which I must call your attention. You have doubtless observed, gentlemen, that the plaintiff's counsel, by all the pertinacity he could possibly bring to his aid, insisted his honour should decide that these defendants should not testify in this case in their own behalf. He based his objection to their testimony on the ground that the code relating to legal practice prevented physicians disclosing any information obtained in their professional capacity. You will remember when Dr. Goelet was called by me as a witness, the plaintiff's counsel at once stated his objection and made a preliminary examination of the doctor to ascertain whether the information which he obtained and was about to testify to was obtained in his professional capacity as a physician. The doctor answered that it was. Then the counsel's objection was formally stated to the court, to wit: That the doctor was not a competent witness, as the information was sacred, and he should not be permitted to testify. What was that done for, gentlemen? The evidence on the one hand had been given. Evidence had been presented that the doctors, these defendants, did and said this and that, and yet the counsel asked his honour, presiding over the trial of this most important case, to decide that the defendants could not testify, virtually clasping and fastening over the mouth of these defendants a solid mask to prevent them from giving their version of the unfortunate accident. Oh, no! gentlemen, he was unsuccessful. His objection was promptly and justly overruled and the proposition decided adversely to him. Then each of these defendants told in turn all that each of them had said to the deceased; what the deceased had said to them; just what they did, and how the unfortunate death of Mr. L. happened. I will not recite it to you. You have heard all the evidence, and wherever there is any difference of question of fact presented by the evidence, you are to decide it. What is more reasonable than the defendants' position that an unfortunate accident had happened for which they in law are not responsible?

You have heard the witnesses testify that death will happen suddenly from chloroform and also from ether, even with the utmost care on the part of the surgeon. There is no dispute of that fact. I have shown you by evidence that all care was used by these defendants. The anaesthetic was administered in a manner approved by the best medical authorities. I have demonstrated that these physicians were justified in administering the anaesthetic as they did. What now remains?

Your verdict in their favour. That is now asked, and justly so. I am about to leave the case of the defendants with you. The curtain of this trial is being dropped, and when submitted to you by his honour's charge, we will await your verdict. What will that verdict be? We feel confident it will be for the defendants. Think of it carefully, gentlemen. What will a verdict for the plaiutiff mean? Let me tell you in a few words. As this is an action for damages in tort, it can be followed by an execution to be issued against the person of these defendants to incarcerate them behind the prison bars. It will be remembered by every surgeon in this land, and no surgeon will dare give an anaesthetic agent until an iron bound contract has been signed by the patient, holding the surgeon harmless for all consequences. Think of it, gentlemen; a verdict for the plaintiff! One of you, who may render such a verdict in this case, may be injured in a few days. You may be seriously injured; amputation may be necessary to save your life. You are in great pain and suffering severely, and the injured member, be it a foot, a hand, or a finger, must be amputated to save your life. Your life's blood is slowly but surely dropping away; you exclaim, "Doctor, I can't stand it any longer! Hurry and give me something to relieve the pain, and amputate!" All is ready for the operation, but your physician suddenly remembers the case of L. against Drs. Goelet and Delphey, in which the jury decided against the defendants. Then your physician tells you, "Not yet; you must wait until I can see my lawyer and have a contract prepared for you to sign, to protect me in case of an accident of any kind." In the meantime you lie suffering, perhaps dying. Think, gentlemen, carefully what results a verdict for the plaintiff in this action will bring.

And now, gentlemen, I am about through. In you we have all confidence that the case is in good and careful hands. In leaving with you this case, I must call your attention to one word in the lexicon more bright than any star in the constellations. I think I can now see it standing out in your attentive and watchful eyes, and that word is that ever far-reaching and effective word, "Justice." Do justice in this case, and as the years roll on and your time comes to leave your dear ones behind you, may you never, never have any cause to regret the verdict given by you in this action. In all sincerity, in all hopefulness in the right and that justice will prevail, I have confidence in asking you to return a verdict for the defendants.

JUDGE TRUAX'S CHARGE.

Truax, J.:

GENTLEMEN: This action is brought by the administratrix of M. L., deceased, to recover compensation for the death of her husband. She alleges that on the 20th day of March, 1892, the defendants, contrary to

the repeated objections and expostulations of M. L., administered chloroform in such quantities as to cause his death on that day, and that such death was due solely to the improper and unauthorised administration of chloroform carelessly and negligently given as aforesaid, and to the want of ordinary care and skill of the defendants, and of each of them.

The defendants deny these allegations; that is, they deny that they administered the chloroform contrary to the repeated objections of the deceased, M. L., and they deny that the chloroform was administered in such quantities as to cause death, or that it was administered in an improper and negligent or careless manner; so that you have, I might call them, two issues to determine. First, was the chloroform administered against the objection of M. L.; and, secondly, was it administered carelessly, negligently, or unskilfully?

Now upon these points the plaintiff has the burden of proof, that is, she must establish from the evidence in the case that the chloroform was administered by the defendants against the objections of M. L., or that if it was administered, it was administered carelessly and negligently and unskilfully, before she can recover in this action. If the evidence has left your minds in such a condition that you cannot answer those questions either one way or the other, then the plaintiff has not proved her case, and your verdict should be for the defendants.

You will observe that I have submitted the case to you in two aspects. The first is, did the defendants administer chloroform contrary to the objections of the deceased, M. L., and the second was in reference to the skill with which the chloroform was administered. You are to determine from the evidence whether or not M. L. objected to the administration of the chloroform. You have heard the testimony of the plaintiff upon that point. I charge you that an objection made by Mrs. L., or by the daughter, is not an objection that the defendants in this action were bound to give heed to, especially when you consider that Mr. L. himself was present. Their wishes do not bind the defendants in this action. I do not pretend to repeat to you the exact words that were used by Mr. L., but you may remember it was something like this: Mr. L. said, "Don't give me chloroform, Doctor," and then he said subsequently, or about the same time, "Don't hurt the old man, Doctor."

The statement of the witnesses for the plaintiff is denied by the defendants; that is, the defendants say that Mr. L. did not give a positive command not to administer chloroform, and therefore I leave this question of fact to you to be determined from the evidence in the case. But if you come to the conclusion that the deceased did in fact say, "Don't give me chloroform, Doctor," I leave it for you to determine whether that was meant as a command, or whether it was the expression of a wish on his part that he was not to receive chloroform, the same as the

other expression, "Don't hurt the old man, Doctor," or "Don't hurt an old man." That question of fact, which you will discuss among yourselves when you reach the jury room, is to be determined by you from the evidence.

Now, if the doctors, against the wish of Mr. L., administered to him chloroform, they became trespassers on that moment, and they are responsible for the results of their trespass. I charge you that the evidence shows that Mr. L. died, not because chloroform was administered, or because ether was administered, but that he died because some kind of an anaesthetic was administered to him; and you must find from the evidence in the case that he died because chloroform was administered to him, before you can hold the defendants in this action upon the trespass view of the case, that I have presented to you.

There is another view that I have suggested to you, and that is the one relating to the skill and care and knowledge of the defendants. The law requires that physicians and surgeons shall be skilful in their profession, and that they shall exercise reasonable and ordinary care and diligence, care and diligence proportionate to the importance of the case in hand. Physicians, however, do not insure success; they are only bound to have the ordinary amount of knowledge possessed by the average of the profession, and they are bound to use only that degree of care and skill that the nature of the case requires, that is, if it is an important case, if they are administering a deadly drug, they are bound to be more careful than they are when they administer a comparatively harmless drug.

Now, you are to determine whether the physicians have violated this rule that I have laid down to you, whether they have in this case failed to exercise care and skill. If they have then they are liable for the consequences of their act. If they have not they are not so liable.

You have listened attentively and patiently I have noticed for the last two or three days to the discussions of the physicians upon this point. You have heard references made to the condition Mr. L. was in at the time the operation was performed. The doctors have told you of the examination that they made, and they have told you what they found and what they did not find; and then you have heard the other physicians testify as to whether or not their conduct under the circumstances was or was not careful.

It is unnecessary for me to go over all this testimony, because I know that it is comparatively fresh in your minds, and that it will be freshened up when you talk amongst yourselves. If the physicians used due care they are not liable, no matter what the result of their action was.

You can easily see, that if a physician at all times was to be held liable for the bad results of an operation performed by him, that we would have no operations performed, or any physicians to perform them. They

would not take the responsibility; but they do hold themselves out as possessing special knowledge in their profession, and do also hold themselves out as exercising care and skill. If they do exercise care and skill, as I have said to you a number of times, they cannot be held liable. If they do not, they may be held liable. It is for you to say whether these physicians have violated the rule I have laid down to you.

The plaintiff sues to recover $5,000 as compensation for the death of her husband. She is entitled to recover such sum as will represent in your minds the pecuniary loss resulting to the next of kin of M. L. from his death, not to exceed $5,000. The statute allows you to fix the damage anywhere within the limit of $5,000, and you are to determine what sum, if you come to the conclusion to find for the plaintiff, will compensate the next of kin of M. L. for the pecuniary loss occasioned to them by his death. You have heard the testimony from his wife as to his earnings, and as to his general condition. You must remember at this particular time he was not the well M. L. of a few weeks before, but on the contrary was suffering from a gangrenous affection of the finger.

I think that Dr. Thomas in referring to that said, "You wouldn't let the man go and die, would you?" Therefore, you must take into consideration the condition that he was in at the time that they gave him the anaesthetic.

The jury rendered a verdict in favour of the defendants.

DISCUSSION.

Dr. E. D. Ferguson, Renssalaer county, said that a case was going on this week, in which two of his townsmen were defendants. He had understood that it was the law that physicians who were present at an operation, not as special assistants, but as physicians simply witnessing the operation, could be made co-defendants, and parties to the suit. This had been held to be the case in Pennsylvania.

Dr. M. W. Townsend said he understood it had been so held in New York state.

Dr. Cronyn said that this was probably based on the assumption that they had been consulted at the time as to the propriety of the operation.

Dr. E. D. Ferguson replied that this had not been taken into account in Pennsylvania.

Dr. Colvin said he had understood that any form of contract that any man might make would not save him if it could be shown that he did not pursue the proper course in treatment; at any rate, he could well remember when physicians had been prosecuted for malpractice, notwithstanding such a contract, and hence there was no advantage in having a contract.

Dr. DELPHY, in closing the discussion, said that in several hospitals in this city at the present time, it was customary before the performance of a laparotomy to require the patients and their nearest of kin to sign some form of contract.

Dr. CRONYN said that it was quite common for railroad surgeons to require the patients to sign a contract before anything was done for them.

TYPHLENTERITIS VERSUS APPENDICITIS.

By John W. S. Gouley, M. D., of New York County.

October 9, 1894.

The frequency and grave consequences of inflammatory action in the region of the human blind intestine; the well known high percentage of mortality, up to a score of years ago, from secondary peritonitis and septicaemia due to perforation of the intestine; and the modern surgical procedures employed for the relief of sufferers from this ailment, have attracted general attention to questions relating to its nature, diagnosis, and treatment. It is not uncommon for laymen to ask, "What is this disease now called appendicitis?" The answer that it is an "inflammation of a part of the bowels," does not always satisfy the inquirer. If he happens to be a scholar, he is naturally disappointed with such a meager answer to his categorical question, and cannot accept the amphigorical term "appendicitis," which conveys to his mind the idea of inflammation of any appendage in or out of the human body. When asked what may be his diagnosis in a case of the kind now under discussion, if, instead of replying, in a discordant medley of Latin and Greek, "appendicitis," the physician were to say, in plain English, "blind-gut inflammation," he would be clearly understood by the learned and by the unlearned. Even the most ignorant rustic knows something of the blind gut in animals, and is ready to believe that it exists in man. The probable reasons why this part of the intestinal canal is improperly named *appendix caeci vermiformis*, and its inflammation "appendicitis," will appear in the following notes:

The word "appendicitis," coined a few years ago to express the idea of inflammation of the blind intestine, surely fails to convey the intended idea. This inaccurate

and hybrid term has evidently arisen from a faulty designation of the first portion of the large intestine. Vesalius is made responsible for the introduction of the term *appendix caeci vermiformis;* but his language has seemingly been misinterpreted, as may be inferred from his words quoted by Hyrtl, who shows that this great anatomist regarded the part now named vermiform appendage as the true *intestinum cæcum*, and that he called *caput coli* the part now known as the *intestinum caecum.*

The three following paragraphs, abstracted from Professor Hyrtl's *Onomatologia Anatomica*, published in the year 1880, are intended as vouchers for what has just been said of the *caput coli* and of the true *intestinum caecum:*

"The beginning of the large intestine was called by the Greeks *τυφλόν ἔντερον.* If Galen and Oribasius had ever dissected human bodies, they would not have called the first portion of the large intestine *τὸ τυφλόν ἔντερον*, '*intestinum caecum*,' blind intestine, for, in man, this is so diminutive that it cannot be regarded as a separate portion of the intestine. It is only in the case of herbivorous mammals that the *intestinum caecum* attains such a size and length as to have led Galen to compare it to the stomach and to call it *δευτέρα γαστήρ, alter ventriculus.* He was so surprised by the size of the *tuphlon enteron* in animals used by him for anatomical study that he was soon ready with a theory—namely, that the already digested food was retained therein until it had accumulated to a quantity sufficient to be expelled at one time."

"Vesalius thought that if any portion of the human intestine was to be called *caecum*, it could only be that slender part appended, as it were, to the head of the colon and similar in appearance to a worm."

"Salomon Albertus afterward described the part of the large intestine called *caecum* as an appendicle like a twisted worm."

It does not appear in these quotations that the two anatomists gave the name *appendix caeci vermiformis* to the true blind intestine.

Rufus of Ephesus, the celebrated Greek physician and anatomist, so frequently quoted by Galen, seems to have given much attention to anatomical nomenclature, and is said to have named *tuphlon enteron*, *intestinum caecum*, that part now called *appendix caeci vermiformis*. His description of the human body is based upon the dissection of apes.

In man this organ is now described as varying "from half an inch to six inches in length, with an average diameter of that of a goose quill." A few years ago Dr. Hermann M. Biggs removed from an adult male subject a blind intestine nine inches and a half long. This is probably the longest ever found in a human being. Among some of the viscera of an adult chimpanzee, kindly sent by Dr. E. T. T. Marsh a few weeks ago, was its blind gut, which measured fourteen inches in length and three eighths of an inch in diameter, gradually increasing to six eighths of an inch at its root. The animal was five feet three inches tall, and weighed one hundred and forty-five pounds.

The portion of the colon generally known as the *intestinum caecum* is far from being blind, for it has three apertures: the first, leading into the so-called vermiform appendage; the second, with two lids, the ileo-caecal valve—which should be called the ileo-colic valve—leading into the ileum; and the third, leading into the ascending colon. The use of the term *caput coli* was traced by Hyrtl to the masters of the Salernum school. The Arabs, says this author, thought it improper to apply the term "blind" to a piece of intestine which has one opening; consequently they called it *al-a'war*, meaning the one-eyed, which by the translators was rendered into the mongrel Graeco-Latin word monoculum. This hybrid term monoculum remained in use throughout the period of the revival of anatomy in all writings. In French it would be *intestin borgne*, which, literally translated into English, would be, intestine blind of one eye. There being in this language no single word equivalent to *borgne*, it would seem well for writers of English to employ the modified Greek term typhlenteron for technical description, and its equiva-

lent—blind intestine—for popular use, without regard to the number of possible eyes.

Hyrtl, in his extended study of the philology of anatomical terms, adopts the views of Vesalius and of some of the other anatomists of the Vesalian epoch, that the blind intestine—now called *appendix caeci vermiformis*—is nothing else than the first portion of the colon; largest in the herbivorous mammalia, slender and long in certain anthropoid apes, rudimentary in man.

It seems highly proper, if only for the sake of approaching exactness, that the name *caput coli*, head of the colon, be retained until a better term is suggested, and, for this and other good reasons, that typhlenteron, *intestinum caecum*, blind intestine, be substituted for *appendix caeci vermiformis*.

It is probably from a misinterpretation of the similes employed by Vesalius and Albertus in their descriptions of the blind intestine that the term *appendix caeci vermiformis* originated. But there is no warrant whatsoever for the coinage of such a word as "appendicitis."

For many years past, endeavours have been made by different writers to introduce briefer terms to take the place of "inflammation of the colon's head and vermiform appendage." Caecitis was used in 1867 by Peebles, of Dublin, and typhlitis was used by hundreds of writers—English, American, German, French, Spanish, and Italian—who, doubtless, knew perfectly well that these two terms signify inflammation of the *blind*, and never meant anything else. The elision of the equivalent of the word intestine in the word typhlitis, either for the sake of brevity or on any other account, does not seem justifiable.

To those who may think it proper to adhere to the term typhlitis on the ground that the neuter adjective tuphlon can be used as a noun, the answer is that enteron is also an adjective, but has long been used as a noun to signify gut. In the sense in which these words appear together, they cannot both be nouns any more than they can both be adjec-

tives; one must be used as a noun and one as an adjective. In English there is no difficulty in the way of their being rightly used, for blind, the adjective, qualifies gut, which, meaning bowel, was always a substantive. But in Greek there is no way out of the difficulty, except to use the adjective tuphlon to qualify the artificial substantive enteron. Whenever tuphlon occurs singly, enteron is understood to have been elided for brevity's sake, so that tuphlon still remains an adjective.

A few modern writers, to whom was distasteful this flaw in "typhlitis" as applied to inflammation of the head of the colon and of the true blind intestine, preferred to employ—for a clearer expression of the idea of inflammation of one or both of these portions of the large intestine—the compound substantive tuphlo-enteritis. This term was used in 1852 by an American writer, Townsend; in 1855 by Ward, of London; in 1861 by Storer, of Boston; in 1865 by F. Mott, of Boston; in 1867 by Homans, of Boston; and in 1877 by Fitz, of Boston; and typhlo-enteritis was used in 1860 by Owen Rees, of London, and in 1865 by Peacock. Gardner's Medical Dictionary, 1847, contains the terms typhlitis and typhlo-enteritis, meaning inflammation of the "caecum," *caput coli*. Dunglison's, Littré and Robin's, and many other dictionaries, apply the terms typhlitis and typhlo-enteritis to inflammation of the *caput coli*, while a few writers use either term to designate inflammation of the *caput coli* and "*appendix caeci*."

The term typhlo-enteritis seems to be inadmissible, because it can be construed as blind inflammation of the intestine. The idea sought to be expressed is not that of the itis of typhlon, but of typhlenteron—that is to say, blind-intestine inflammation. Hence it is that some writers expunged the hyphen and made the continuous word typhloenteritis, which, however, is open to several objections, among which are: (1) It contains too many syllables; (2) it is not euphonious; and (3) it is not in accord with the canons of word-building.

By a slight modification of the term typhloenteritis it seems as if the idea of inflammation of the true blind intestine might be briefly and clearly expressed. This modification may be effected by eliding the o of typhl[o]enteritis and uniting the two members needed to form the single word typhlenteritis, which contains precisely the same number of syllables as "appendicitis."

The contraction from typhlon enteron to typhlenteron, as denoting a concrete substance, is not strictly correct, because, as a general rule, an adjective should not be combined with the noun which it qualifies. Such a contraction is, however, regarded by high authorities in philology as allowable in technical terms for the sake of brevity and euphony, and seems to have been sanctioned by Aristotle and other Greek writers on science, in whose works similar contractions appear. This contraction being allowable, it follows that the contraction from typhloenteritis to typhlenteritis is also allowable. There is a great difference between such a contraction and the elision of a whole word, as in "caecitis" and "typhlitis."

It is therefore hoped that the anatomists will agree to adhere to the old term *caput coli* instead of "*caecum*," and call the "*appendix caeci vermiformis*" by the name typhlenteron, *intestinum caecum;* that the nosologists will substitute typhlenteritis for "appendicitis"; and that the surgeons will adopt the term typhlenterectomy, excision of the blind intestine, instead of "excision of the vermiform appendage of the caecum."

DISCUSSION.

Dr. CHARLES PHELPS, of New York county, said that there seemed to be little room for discussion of Dr. Gouley's paper, but it certainly deserved commendation. The term "appendicitis" seemed to him to be one of the worst of the many abominable terms used in surgery. The term recommended by the author not only had the advantage of traditional use, but was properly constructed, was euphonious, and expressed anatomically correctly the exact situation of the disease. It had long seemed to him that the term "appendicitis" might be replaced by some other, and the proposed substitute seemed to be a remarkably good one.

THE NECESSITY OF INTERNATIONAL SANITARY REGULATIONS GOVERNING THE MIGRATION OF LARGE BODIES OF PEOPLE IN THE PREVENTION OF THE SPREAD OF CONTAGIOUS AND EPIDEMIC DISEASES.[1]

By Stephen Smith, M. D., of New York County.

Read by title October 9, 1894.

Those diseases which are classified as contagious and infectious are the common enemies of mankind. Every human being inherits a predisposition to these affections. No one, therefore, is exempt from an attack, on proper exposure, by reason of nationality, civilisation, rank, or condition. In their spread these pestilences have no regard for the lines which bound nations, but wherever man finds his home there they find a congenial soil for propagation.

The influence of these diseases upon the history of our race has always been disastrous. They have proved more fatal to human life than all other causes combined; they have destroyed the armies of conquerors whom no earthly power could resist; they have, indeed, obliterated from the earth, as by an omnipotent force, whole races of mankind. They have often given the death-blow to an advanced civilisation, or have left a strange enduring impress on the intellectual life of great nations. The historian states that among the causes which brought about the fall of the might and civilisation of Greece and Rome must be mentioned destructive pestilences which swept over the Eastern and Western Roman Empire during the period between antiquity and the Middle Ages.[2]

[1] Illustrated by the International Sanitary Conference of Paris, 1894.
[2] Ziemssen.

The problem of preventing and suppressing these scourges of the race has been studied exhaustively in ancient and modern times, but with very different degrees of success. To the ancient student their origin remained a mystery which no means at his command could penetrate. With all his research he could discover neither their causes nor the laws governing their propagation. One solitary fact of vast importance was impressed upon his mind by the abundant opportunities for observation, viz., that complete non-intercourse of the sick, and his personal effects, with the well was a reliable means of protection and prevention. Hence came the famous institution of quarantine, or forty days isolation of vessels from infected ports, a period believed to be sufficiently long for the destruction of the contagion. Its true significance was non-intercourse of the sick with the well. This was, indeed, the only means by which a city could at that time protect itself from an invasion of the pestilence. And even now cities and states, when left to their own individual resources against epidemic diseases, find quarantine as the most effective measure which they can adopt. It is true that the quarantine of to-day differs greatly from the quarantine of the past. Formerly, time was the chief feature relied on to destroy the contagious principle, and hence the period of detention was of long duration. Now, detention is enforced only during the period necessary for the destruction of the contagium by germicides, or of the incubation of the germs of disease. Still, quarantine means the detention of the traveller and his effects, and of articles of commerce liable to convey infection.

Though the rigours of the ancient quarantine have been relaxed, it was not until within the last decade that there began to be a clear conception of a method of substituting for them measures far more effective, and comparatively free from inconvenience, either to traveller or to commerce. This was the co-operation of the states exposed to the epidemic in well-concerted measures against a common enemy.

The first step toward international action in regard to

public sanitation and maritime quarantine was taken in 1847 by the French government, which has always been foremost among the nations of Europe in advancing sanitary science. Preliminary to the calling of an international sanitary conference, she appointed medical sanitary agents in the East. The posts of observation thus created were at Constantinople, Smyrna, Beirut, Alexandria, Cairo, and Damascus. The information in regard to sanitary conditions in those cities derived from these sources formed the basis for the conference of Paris, which was convened on invitation from the French government in 1851. Twelve powers were represented by delegates at this conference. The results obtained were a relaxation of the rigour of quarantine in Mediterranean ports, and a scheme of rational maritime prophylaxis.

Thus was inaugurated international hygiene, a system of sanitary administration which seems destined to control, suppress, and finally exterminate contagious and infectious diseases.

Nine international sanitary conferences have since been called, and six have been held. The earlier conferences were not fruitful of immediate results. The field of labour was new and unexplored, and diplomatic questions arose which greatly interfered with that harmony of action of states essential to success. The discussions of representatives of different states did, however, improve the sanitary administration of each. But their greatest value appeared in the better understanding which the states of Europe came to have of the aims and purposes of each other when discussing measures of prevention against a common enemy. Mutual confidence was in a measure established, which led to far more effective work in future conferences. This was apparent in the conference of Venice, the seventh in the series, held in 1892, which was called to consider the means of preventing direct communication between Europe and the infected regions of India, by way of Egypt and the Mediterranean ports. The conference succeeded, first, in regulating the duration and method of quarantine in the Suez canal;

second, in preventing the passage through the canal of infected vessels; third, in requiring disinfection of suspected vessels; fourth, in creating the council of Alexandria, with a preponderance of European influence.

The resolutions adopted by the conference were embodied in an agreement which was signed by the plenipotentiaries and afterward ratified by the powers represented—the first formulated conclusions of any conference made authoritative by the signatures of the plenipotentiaries.

Still greater progress was made toward the creation of international laws by the eighth sanitary conference, which met at Dresden, March, 1893. The programme proposed for consideration the following subjects:

1. The duty of a government when cholera is reported within its territory.

2. The measures to be taken when cholera exists in a neighbouring country.

The conference decided that the declaration of the presence of contagious diseases is obligatory, and that every means should be taken to prevent its spread. It formulated a system of sanitary measures, which afforded a maximum of protection for public health with a minimum of restriction to travel and traffic; it fixed the period of detention and isolation; it defined the distinction between medical surveillance and observation; and finally it permitted a person arriving from an infected port to proceed to his destination, but it maintained a rigid observation of him during the period of incubation of the cholera germ. The resolutions of this conference were followed by a convention, which was signed, with but one or two exceptions, by all of the powers represented.

These last two conferences proved conclusively that international agreements could be made designed to prevent an invasion of Europe by cholera, which, though placing severe restrictions upon commerce and travel, were not incompatible with the laws and customs of the contracting powers. But valuable as these agreements might prove to be, they

were simply barriers erected around the immediate frontier of the state against a foe, whose habitat was in the far distant delta of the Ganges. Modern science has proved conclusively that the germs of this plague have never left their native soil except they were conveyed by human agency. Repeated epidemics had also demonstrated the fact that cholera never invaded the districts of Northern and Western Asia, except when large bodies of people made pilgrimages to the holy places of the Orient. The chief and most important of these pilgrimages was that to Mecca by the pilgrims of India. It was equally demonstrated by repeated observations that cholera reached Europe only through its pilgrims who visited the holy places of Asia, and especially Mecca. It became, therefore, a well established fact that the transmission of the cholera infection from India to Europe was, in its first stage, through the pilgrimages of the Mussulmans from India to Mecca, and other places of resort. At these places it was transferred to the European pilgrim, who conveyed it to Europe. It was evident that the international rules and laws enacted did not meet existing conditions. As a matter of fact, cholera appeared at Mecca eight times between 1871 and 1893. The European states, therefore, could not be certainly protected when the cholera infection was brought without hindrance to Mecca, and the European pilgrim was allowed to visit Mecca, and return without any proper sanitary surveillance.

Such considerations as these induced the French government, always alert in its efforts to provide adequate measures for the prevention of cholera epidemics, to issue a call for another conference, the ninth in the series, and the fourth called by the government of France. The object of this conference was to provide measures for preventing, by international agreements, the transmission of cholera from its native habitat by pilgrims. The task was the greatest and most important ever undertaken by any state or combination of states.

The ninth conference met in Paris on February 7, 1894,

and was attended by representatives from sixteen states, viz., all the powers of Europe, except Switzerland; and Persia, and the United States, Egypt, the British possessions in India, and the Strait Settlements of Netherlands.

In his opening address the president of the conference, M. Casimir-Perier, now president of the French republic, eloquently portrayed the duties of the assembled delegations. "The modern scientific spirit," he remarked, "has proved both its firmness and its flexibility in the course of extended efforts to combat the Asiatic pestilence by means of international agreement. By more exact information of the disease and the phenomena attending its transmission, it has gained a knowledge of prophylactic measures, both more certain and more prompt. It has demonstrated that the more simple methods are at the same time the more efficacious. It has conserved public interest at the same time it has protected human lives. The conventions which diplomacy has had the honour of concluding have been matured in the laboratories where men of science pursue their disinterested researches. It is the common labour and the common honour of science and diplomacy to acquire and exercise the knowledge necessary to reconcile the customs which govern international commerce, and the laws on which depends the protection of human life. . . . You have to continue now the labours which were commenced at Venice. It is your duty to pursue cholera toward its source; toward that part of Central Asia where it is said to have its origin so far as it affects us. This part of your task is particularly delicate, and the method and the principles which have heretofore guided you should again govern your actions. They are now recognised as correct, and they have hence acquired a high authority. But in applying them you should not forget that sympathy for those who suffer, individual kindness, and international fellowship, generosity, and equity, ought also to have their proper place in your deliberations. It is in these previous deliberations that you will have found the discretion necessary to unite to all of the guarantees that health and the public interests

may require, respect for local customs, usages, and traditions, and especially that persuasive influence which shall secure to your decisions the concurrence of all upon whom they ought to be binding."

M. Barrére, the acting president, after explaining at some length the events which led to the present conference, introduced Professor Proust, who read an elaborate paper, in which, after reviewing the work of preceding conferences, showing how effectually they had protected the immediate approaches to Europe from an invasion of cholera, he proceeded to detail the questions which the present conference was called to consider. They involved problems more difficult of solution than any ever presented to a deliberative body. The danger to Europe from an epidemic of cholera, primarily, depends upon the periodical migration of large bodies of the Mussulmans from India, the natural habitat of the cholera germ, to the holy places of Northwestern Asia, and especially to Mecca. Cholera has never visited Europe, except when transported from the delta of the Ganges by pilgrims. These pilgrimages are made by vast hordes of people, the greater number of whom are poor and feeble, or actually sick, and all are accustomed to filthy habits. It appears that sixty per cent. of those who leave India on these pilgrimages never return to their homes. The problem of preventing epidemics of cholera in Europe could only be solved by subjecting these pilgrims to rigid sanitary regulations, and to effectually accomplish this object there must be international agreements.

The difficulties to be encountered in adopting and enforcing sanitary rules for pilgrims were numerous. 1. The pilgrims themselves would be intolerant of any restrictions upon their performance of a religious obligation. 2. Sanitary regulations adequate to prevent the transportation of cholera infection must in some degree interfere with the ordinary freedom of commerce. 3. These sanitary rules and regulations, in order to be effective, must be enforced under the supervision of a central authority, and not by local authority.

It was very evident, therefore, that this conference was confronted with difficulties which no other had to encounter. While it might prove an easy task for the technical delegates to formulate an ideal code of sanitary rules which, if rigidly enforced, would effectually prevent the transportation of cholera by the pilgrims, it was apparent that the diplomatic delegates would have no slight difficulty in reconciling the various commercial and public interests involved.

It will forever redound to the credit of this Conference that it resolutely set to work on the programme laid before it, and not only created a body of admirable sanitary rules governing pilgrimages, but provided adequate means of enforcing them.

The programme presented by the French delegation was as follows:[1]

I. Prophylaxis of the Pilgrimage to Mecca.
II. Protection of the Persian Gulf ports.
The programme of discussion was formulated as follows:
I.—Prophylaxis of the Pilgrimage to Mecca.
(*A*) Sanitary police in Indian ports.
1. Medical inspection of pilgrims.
2. Disinfection.
3. Refusal of embarkation of infected or suspected persons.
4. Refusal of embarkation to all pilgrims who shall fail to show that they possess means to defray the expense of the pilgrimage; five days' observation of other pilgrims.
5. Sanitary passport.
6. Disinfecting apparatus on each vessel.
7. Adequate supply of potable water protected from infection.
(*B*) Sanitary surveillance of pilgrims at the entrance of the Red Sea.
1. Choice of site for quarantine station.
2. If Camaran be chosen, improvements to be instituted.
3. Disinfecting apparatus.
4. Formation of board of management to be under the control of the sanitary council of Constantinople.
(*C*) Improvements to be instituted at Abou-Saad and Vasta.
(*D*) Supervision of land caravans of pilgrims to Mecca.
(*E*) Reorganisation of the sanitary station of El Tor.
II. Protection of the Persian Gulf ports.
(*A*) Establishment of sanitary posts at Fao, Bender-Abbas, Koveit, Bender-Bouchir, Bassorah, Mohammerah.

[1] See Abstract of Sanitary Reports issued by the U. S. Marine Hospital Service for Summary of Conference proceedings.

(*B*) Sanitary surveillance at Menama, in the Bahrem group of islands.
(*C*) Sanitary supervision at Mascate and Guadar, in Beloochistan.
(*D*) Constitution of a sanitary authority to have charge of carrying out quarantine measures.

A wide divergence of views in regard to the best method of treating an epidemic of cholera very early appeared among the technical delegates, and became very pronounced in the discussion of many questions throughout the entire session. These different opinions were as follows:

1. The French delegates held that cholera infection should not be allowed to be conveyed from place to place, either by travellers and their effects or by articles of commerce, hence they approved of enforcing such sanitary rules as would free the traveller and his baggage, as well as articles of commerce, of the contagion of cholera at any place in their transit where they were discovered or suspected to exist. This policy was sustained by every delegation except that representing Great Britain and its dependencies.

2. The British delegation held that the proper method of dealing with cholera is to perfect the sanitary conditions of cities, villages, and the homes of the people, and allow the contagium of the pestilence free course along the routes of travel, whether by sea or land. All barriers to the entrance of cholera into any state were condemned, especially any form of quarantine which delayed the progress of vessels into ports and the immediate discharge of cargo. This public policy was supported only by the delegation from Great Britain.

3. The delegate who represented the British possessions in India, held that cholera is due to epidemic influences quite beyond human control; hence he advocated non-interference. This policy was supported only by the delegate who represented India.

The scope and character of the regulations adopted can be illustrated by a few selections. In general it may be stated that the pilgrim is placed under sanitary surveillance of a very rigourous character, from the moment he announces his intention to go on a pilgrimage till his return home. First,

he must obtain a sanitary passport from the local authority. This rule is taken from the Netherlands' Straits Possessions. Before the passport is issued, the intending pilgrim must prove that he has complied with all of the conditions necessary for his departure; and that he has money sufficient for the voyage, and to sustain his family in his absence. This passport the pilgrim must retain and show to the sanitary authorities en route, and he can enter Hedjaz, the province in which Mecca is located, only on presentation of it, and on passing an examination. He is under sanitary observation while at Mecca, and on his return a new passport is given him, which he must show to the authorities en route.

At the port of departure the pilgrim comes under the sanitary police, and the following regulations are to be enforced:

Medical inspection of all persons taking passage on board a pilgrim vessel, made individually, by daylight, on land, and by a physician appointed by the local sanitary authority.

Thorough disinfection made on land under the direction of the physician appointed by the sanitary authority of all infected or suspected articles.

Refusal of embarkation to any person attacked with cholera or choleriform disorders.

When a case of cholera exists at the port, embarkation on board of pilgrim vessels shall not take place until the persons to be embarked have been segregated and subjected to observation for five days.

Each pilgrim vessel must have the following provisions:

Every vessel embarking one hundred or more pilgrims shall carry a physician commissioned by the government to which the vessel belongs. If the number of passengers exceeds one thousand, a second physician shall be engaged.

The physician should see that the rules of hygiene are observed on board, and that food and water are distributed according to agreement.

Pilgrims shall be lodged between decks.

The deck should remain clear. It should be placed at the disposal of the passengers.

Passengers shall be allowed to retain only such baggage as is strictly necessary.

The vessel shall be provided with latrines in the proportion of one to each one hundred passengers. These shall not be located in the hold or between decks. They shall be cleaned three times daily and flushed with sea water.

Each person shall be gratuitously furnished with five litres of drinking water a day.

If there shall arise any doubt as to the condition of the drinking water it should be boiled and sterilised, and the captain is directed to empty it overboard, and replenish at the first stopping-place.

Two kitchens shall be provided for the use of the pilgrims. They shall not be allowed to cook elsewhere.

Medical care and attendance shall be furnished gratuitously to the pilgrims.

A regularly organised infirmary shall be provided for the sick. It shall be large enough to accommodate five per cent. of the passengers, with a space of three square metres per capita.

The vessel shall be provided with the means of isolation in case of choleraic attack.

Each pilgrim vessel is subjected to the following regulations at the port of departure:

The captain of a pilgrim vessel is required to declare to the port authority, at least three days in advance, his intention of embarking pilgrims. He must also declare the date of intended departure and the port of destination.

The sanitary authority of the port shall then inspect and measure the vessel. The consul representing the flag carried by the ship may assist, if he so desires, at this inspection.

The port authority shall not permit the departure of a vessel until he is assured,—

(*a*) That the vessel is clean, and, if possible, disinfected.

(*b*) That it is in condition to undertake the voyage, and that the sanitary conditions are good.

(*c*) That the food and fuel provided for crew and passengers are sufficient in quantity and good in quality.

(*d*) That the water is good and obtained from a pure source; that it is sufficient in quantity, protected from contamination on board, and dispensed by faucets.

(*e*, *f*, *g*, *h*) That the vessel carries distilling apparatus capable of producing five litres of water a day per capita for all persons on board, passengers and crew; that it carries a disinfecting stove, and has on board a physician and a ship's medicine chest, and that the deck is clear.

The captain shall post notices drawn up in the principal languages spoken by the pilgrims, stating,—

1. Destination of the ship.
2. Daily ration of food and water.
3. The price of provisions not included in the daily distribution.

The captain shall not be free to leave port until he holds,—

1. A list of the pilgrims whom he is authorised to embark, viséd by the port sanitary authority.

2. A bill of health stating the name, nationality, and tonnage of the vessel, name of the captain and physician, the number of persons embarked, crew, passengers, and pilgrims, nature of the cargo, place of departure and destination, and condition of public health in the port of departure.

During the voyage the following requirements are enforced:

All articles that have come in contact with the sick shall be promptly disinfected. Articles of no value should be thrown overboard if the vessel is at sea, or else burned if the vessel is at port.

In case of a death occurring on board during the voyage, the captain shall note the fact, with all particulars.

The bill received at the port of departure shall not be altered in any way during the voyage. It shall be viséd in every port at which the vessel stops by the sanitary authority, who shall note thereon,—

The number of passengers landed or embarked.

Any facts touching the condition of the passengers, and any incidents of the voyage.

The sanitary condition of the port at which the vessel is stopping.

The captain shall see that all prophylactic measures taken on board during the voyage are inscribed in the log.

The captain shall pay all sanitary taxes.

Arriving at the Red Sea, and before proceeding to Hedjaz, the pilgrim ship must touch at the sanitary station at Camaran, and there be subject to the following treatment:

Vessels declared upon medical inspection to be clean, shall be allowed free pratique after compliance with the following regulations: The pilgrims shall be disembarked; they shall take a spray bath, or a bath in the sea; their soiled linen and such of their baggage and effects as may be suspected of infection shall be disinfected. The duration of this process, including landing and reëmbarkation, shall not exceed forty-eight hours. If during this period no case of cholera, diarrhoea, or choleriform disorder shall develop, the pilgrims shall be at once reëmbarked and the vessel shall proceed to the Hedjaz.

Suspected vessels—that is to say, vessels on board of which cholera declared itself at the moment of departure, but on which no new case has occurred within seven days—shall be treated as follows: The pilgrims shall be disembarked; they shall take a spray bath, or else a bath in the sea; their soiled linen and such of their baggage and effects as may be suspected of infection shall be disinfected, at the discretion of the medical officer. The duration of this process, including landing and reëmbarkation, shall not exceed forty-eight hours. If no case of cholera

or choleriform disorder shall develop during this period, the pilgrims shall be at once reëmbarked, and the vessel shall proceed to Djeddah, where a second medical inspection shall be made on board. If the result is favourable, on the written and certified declaration under oath that no case of cholera has occurred during the voyage from Camaran, the pilgrims shall be disembarked. If, on the contrary, cholera or choleriform disorder shall have declared itself during the voyage, or at the moment of arrival, the vessel shall be remanded to Camaran, and there undergo a second time the treatment for infected vessels.

Infected vessels—that is to say, vessels on board of which cholera and choleriform disorder shall have declared itself within seven days—shall be treated as follows: The persons attacked with cholera or choleriform affections shall be disembarked and isolated in hospital. Thorough disinfection shall be performed. The other passengers shall be disembarked, and isolated in groups consisting each of as few persons as possible, in order that only a small front shall be exposed to choleraic attack should the disease develop. The soiled linen, utensils, and clothing of crew and passengers shall be disinfected; also the vessel itself.

The sanitary authorities shall decide whether the unloading of the larger baggage and the cargo is necessary, and whether the entire vessel, or only a portion of it, shall be disinfected.

The passengers shall remain five days at Camaran. If the cases of cholera date back for several days, the period of isolation may be curtailed. It shall vary according to the date of the last outbreak, and in the discretion of the sanitary authority.

From Camaran the vessel shall proceed to Djeddah, where thorough medical inspection shall be made on board. If the result is favourable, the pilgrims shall be disembarked. If, on the contrary, cholera or choleriform disorder shall have developed on board, either at the moment of arrival or during the voyage from Camaran, the vessel shall be remanded to Camaran, and shall there undergo, for a second time, the treatment for infected vessels.

Such is but a summary of the rules made by the conference governing the pilgrimages from India by way of the Red Sea. Similar rules were made to apply to pilgrims going by way of the Persian Gulf, or approaching Hedjaz from the north. These rules were to be equally enforced on the return of the pilgrims to their homes by any route. While at Mecca the pilgrims were under rigourous sanitary surveillance.

An examination of these rules will make it apparent that if they are rigidly enforced, cholera cannot reach Europe again through the medium of Mussulman pilgrimages. And herein we have the possible failure of the work of the con-

ference. Sanitary rules are worthless if not faithfully executed, and yet no class of laws is so difficult of enforcement as those designed to protect the public health.

In their practical application, to be effective in the prevention or control of contagious and infectious diseases, individual rights, religious observances, commercial interests, and even national customs, must be subordinated to the exigencies which these pestilences create.

It has been held that health laws are anomalies in civilised government. They arbitrarily set aside ordinary laws because they are adapted to an anomalous condition of the people. When it is considered that the health laws created by the conference were to be applied to people intolerant of any restriction upon individual liberty, and especially upon the customary performance of ancient religious obligations, it will be apparent that when the technical delegates had perfected their work of completing the rules and regulations, a serious responsibility was imposed upon the diplomatic delegates in providing the ways and means for their execution.

There was a strong disposition manifested by those states within whose jurisdiction these rules were to be chiefly executed, to be alone responsible for their enforcement. But the other states very properly opposed such action, alleging that local interests might interfere with that rigid execution of every necessary detail so essential to success. A failure of one state, through which the pilgrims might pass, to rigorously apply the rules, would imperil the entire scheme. It was determined therefore, after much discussion, that all of the contracting powers should have a part in the enforcement of these international agreements. The following method of accomplishing this object was finally agreed upon:

1. The application of the measures adopted by the conference in regard to the pilgrimages shall be intrusted to a committee chosen from among the members of the council of health of Constantinople. This committee shall be composed of three representatives of Turkey and of the several powers who accepted the sanitary agreement signed

by the conferences of Venice and Dresden. The president of the committee shall be an Ottoman.

2. To secure effective service at the several sanitary stations, competent corps of physicians, disinfectors, mechanics, and sanitary guards, recruited from among ex-officers, commissioned and non-commissioned, shall be created.

3. The expense of carrying out the system proposed by the conference shall be divided between the Ottoman government and the council of Constantinople, according to the scale already fixed by the several powers interested.

4. The sanitary authority at the Ottoman port of arrival or departure shall draw up a statement of any infraction of this agreement, to which the captain of the offending vessel shall attach any explanation he may have to make. A certified copy of this statement shall be transmitted to the consul representing the country to which the vessel belongs. The consul shall require the fine to be placed in his hands. In the absence of the consul the fine shall be deposited with the sanitary authority. The fine shall ultimately go to the council of Constantinople, when the consular commission shall have declared it valid. A second certified copy of the statement shall be forwarded to the council of Constantinople, who shall refer it to the consular commission.

5. A consular commission shall be formed at Constantinople to have cognisance of disputed cases, and to act as judge between the sanitary agent and the ships' captains. It shall be elected every year.

6. The taxes and sanitary fines shall not be diverted to any objects but those relating to the sanitary councils.

In addition to these regulations the conference provided for the equipment of suitable stations on the route of the pilgrims, with all the apparatus necessary to make each a sanitarium, where the traveller will receive the most perfect sanitary care and treatment. The Ottoman government had already created several stations, and the conference took measures to perfect them and add others. Thus the island of Camaran, near the entrance to the Red sea, it recommended should be entirely devoted to a sanitarium for the pilgrims coming from the south. For this purpose all the present inhabitants are to be removed, the harbour is to be rendered secure to shipping, and every facility supplied for the comfort of passengers, and the thorough cleansing and disinfection of themselves, their effects, and the pilgrim ships. In the same manner, Djebel-Tor, at the northern extremity of the Red sea, is to be provided as a sanitarium for the

pilgrims from the north. The ports of Hedjaz, where the pilgrims debark for Mecca, are to be equally well equipped as sanitary stations. A large number of similar sanitary stations will be created along the Persian Gulf route, and also along the overland caravan routes. Finally, Mecca is to have its sanitary conditions perfected, and a complete surveillance of the pilgrims organised.

For nearly two months the conference devoted itself assiduously to its duties. It was aided and encouraged in its work by the highest officials of the French government. President Carnot frequently met the delegates; M. Casimir-Perier, the premier, accepted its presidency. M. Barrére, now ambassador to Switzerland; M. Hanotaux, now minister of foreign affairs; Professor Brouardel, dean of the Faculty of Medicine, of Paris; Professor Proust, inspector general of the sanitary service; and M. Monod, councillor of state, comprised the French delegation. To the courtesy, constant efforts, and judicious management of this delegation is due in large measure the harmony which characterised the deliberations of the conference and the happy consummation of its labours.

The code of sanitary rules governing the migration of large bodies of people from or through districts infected with cholera which the conference finally completed and adopted, is based on the most advanced principles of sanitary science. When this code is finally accepted by the powers of Europe and Asia, and by the United States, and then becomes in effect international law, it will mark the commencement of an era which will be characterised by the extermination of those roving pestilences which have heretofore been the scourge of the human race.

One feature of the conference remains to be noticed, which is of special interest to the people of the United States. As this conference was called to devise international measures to prevent the transportation of cholera by the migration of large bodies of people, it seemed to the delegates from the United States, or at least to a majority

of them, that it would be a fitting occasion to consider also the closely allied subject of the conveyance of cholera from Europe to the United States by emigrants. It was apparent that the sanitary rules and regulations relating to travel and traffic which would prevent the transmission of the cholera infection from India to Europe by the pilgrim, would, if properly applied, prevent the transmission of cholera from Europe to America by the emigrant. The instructions which the delegates received from their government led them to believe that the president also entertained the opinion that the question of the transportation of cholera by emigrants would be a legitimate subject of discussion in the conference.

Actuated by these considerations the delegation brought the matter before the conference at its third session in a formal paper. It was shown in this statement that cholera has as yet never reached the United States from Europe except through the emigrant classes. The imminent danger of an invasion of the United States by cholera, when it is prevalent in Europe, will appear when we consider:

1. The vast numbers of immigrants who land on our shores annually. In 1893, 357,857 emigrants from Europe arrived at the single port of New York. In some years the number has been quite half a million.

2. These immigrants are, for the most part, the poorest, filthiest, and most insanitary class of the population of the states of Europe. They are not only extremely filthy in their persons and habits, but they bring large quantities of filthy baggage and household goods, which are admirably adapted to preserve the germs of contagious and infectious diseases in all their potency.

3. The rapidity with which the transit of the ocean is now made by the great passenger vessels—and it is on this class of steamers that the bulk of the immigrants reach the port of New York—renders it possible now for an emigrant to receive the cholera into his system in Europe and be safely domiciled in New York city before the period of incubation has fairly expired.

To meet these exigencies, the United States has but one remedy, and that is a rigourous quarantine. Such sanitation of cities, villages, and the homes of the people, as might make it safe to allow the cholera contagium free access to our ports, is impossible. The opinion was expressed that if, by an international agreement, such sanitary regulations could be enforced as would secure to the emigrant from Europe to America, cleanliness of person and baggage, adequate means for his care during the voyage, and a reasonable guarantee that he is not the carrier of the cholera germ, that it would be followed by greatly diminished restrictions which our government must otherwise impose upon travel and commerce in our ports.

The communication of the delegates concluded by requesting that the programme of the conference be so enlarged as to include the preparation of international sanitary rules governing the migration of the labouring classes of Europe to America.

At a subsequent session the United States delegates submitted more in detail, at the request of the conference, the questions for consideration. The several propositions were nearly those already under discussion in regard to the pilgrims, viz.:

1. Measures to be adopted to enable the emigrants to come to the port of departure free from contagious diseases. Each emigrant should obtain from the local authority a passport or certificate, showing the sanitary condition of the place from which he came, the route that he has followed to the port of departure, and, as far as possible, the state of his health during his journey. The passport for the pilgrim made nearly the same provision.

2. Measures to be taken at the port of departure to prevent the germs of cholera being taken on board of vessels, either by the emigrants personally, or by their clothing, or other effects. These measures would correspond with those adopted by the conference with reference to pilgrims at the port of departure, viz., detention for several days in reception

quarters where bathing and disinfection could be thoroughly performed and any infection present destroyed.

3. Measures to be taken to secure the best sanitary condition of vessels carrying emigrants, before their embarkation, in order that the health of the emigrants may be preserved during the voyage. The excellent sanitary regulations which the conference adopted for pilgrim ships would apply with some modifications to emigrant ships.

4. Measures to be taken during the voyage both to preserve the best sanitary condition of the ship, and of the emigrants and equipage, and to promptly suppress any focus of infection which might develop on board. These provisions were amply made by the conference with regard to pilgrim ships during the voyage.

Measures to be taken at the port of arrival, which would comprise such changes in the regulations of our quarantines as would adapt them to the new conditions which these international regulations would secure as to the liability of emigrants to be the carriers of cholera infection.

The communication of the American delegates was received with marked attention by the members of the conference. It was conceded that there was such a close analogy between the methods of conveyance of cholera infection from India to Europe by the pilgrims, and from Europe to America by the emigrants, that the international sanitary regulations governing the migration of one class would be nearly applicable to the other. The delegates of several states cordially adopted the views of the American delegates, and were disposed, at once, to consult their respective governments to obtain the power to enlarge the programme in accordance with our request. Others, while acknowledging the great importance of the subject, were of the opinion that, as the present conference was called for a specific purpose, it should not add to its duties another obligation, however closely it might be allied to the one in hand. They proposed that the emigrant question be deferred to another conference called for that special purpose. The British delegation opposed enlarging

the subjects for discussion at the present conference, and also the calling of another conference to consider the emigrant question, basing their objections upon their often-reiterated opinions that the prevention of the spread of cholera should not be attempted by restrictions upon travel and commerce, but that every state should secure to its people homes so healthy that they would defy the potency of the cholera germ. It should be stated that, at one of the sessions of the present conference, on the occasion of the statement of the above opinion by the distinguished medical officer of the Local Government Board of England, the technical or medical delegate of Greece replied that his government had no such power as would secure that degree of sanitation of the homes of the people of which the English boast, and it must, therefore, rely upon a rigourous quarantine against cholera. As to the value of home sanitation compared with a rigourous quarantine in the protection of the people against cholera, he reminded the British delegation that during the last year there were several outbreaks of cholera in England, with a number of deaths, while for forty years there had not been an outbreak of cholera in Greece, though the pestilence had many times prevailed in surrounding countries.

After considerable discussion the conference decided not to change its programme, but with much unanimity concurred in the opinion that another conference should be called, if requested by the government of the United States, to formulate international sanitary regulations governing the migration of European populations to America.

Meantime the delegates from several of the powers received instructions to unite in the call of such conference, and two delegations presented the formal requests of their governments to be permitted to entertain the conference at their respective capitals. The United States delegation reported the action of the conference to their government, and asked for instructions. The president replied that it was too late in the season to call another conference. Thereupon farther efforts to arrange for a conference were discontinued, but the

final sentiments expressed to us by many members were to the effect that, whenever the United States government signified to the European powers its desire to enter a conference with them for the purpose of establishing an international agreement relating to the sanitary supervision of emigrants from Europe to America, all of the states invited would respond.

To one who has practically studied the problem of the prevention and suppression of such world-wide epidemics as Asiatic cholera, the importance to the people of the United States of the co-operation of the governments of Europe with our government, in freeing the emigrant from the germs of contagious and infectious diseases before he embarks for our ports, cannot be over-estimated. The proposed scheme of sanitary surveillance of the emigrant would begin at his domicile abroad, and follow him every step of the way to his home in this country. His passport, issued by the local European health officer, and viséd at every point in his progress, would not only contain a record of his condition as regards his freedom from infection and his health, but it would be his only guarantee that he could travel at all on railways to the port of departure, or that he could embark on any steamship bound to a port in the United States. It is at once apparent that such an international agreement would bring to our shores only healthy emigrants, and in healthy ships. Two consequences would inevitably follow, viz., first, cholera would never be brought to this country by the European emigrant, and second, our quarantine would consist only in a detention for the examination of the passports of emigrants and the inquiries and inspections necessary to determine that ship-masters had faithfully complied with the international sanitary regulations.

Thus closed the Ninth International Sanitary conference, in many respects the most important of the series. It was, in fact, a congress of nations summoned to create a code of international laws, entirely in the interests of human health, and consequently of human happiness. Its sessions were

characterised throughout by that earnestness in the discussion of theoretical questions and that conciliation in harmonising practical methods, which distinguish the modern scientific spirit. We cannot doubt that when the laws which it enacted are faithfully executed, not only will Europe and Northern Asia be relieved from periodical visitations of the most destructive plague of modern times, but that the vast hordes of roving pilgrims which traverse Asia, scattering a pestilence which decimates the people among whom they pass, while it strews their own pathway with their dead, will be transformed to an orderly body of travellers, characterised by that physical and mental health and cleanliness of person and baggage, so essential to the rational discharge of religious obligations.

But have not the nations which in this conference accomplished so great a work in the relief of the Mussulman pilgrim, and the protection of Europe from cholera, a similar duty to perform toward the western emigrant, who, taking up the germs of the plague brought to Europe, conveys them in his filthy person and effects to America? M. Casimir-Perier complimented the delegates to the Ninth International Sanitary conference on the success which science has had in breaking down those ancient barriers which the varied interests of mankind have created, and urged them to persevere in the good work until all such restrictions are removed. Must there not be a tenth conference which shall unite the efforts of the European powers and the United States in removing those barriers with which commerce and custom protect the emigrant from the application of those sanitary measures which would strip him of every form of contagion, and bring him to our shores in good physical and mental health?

THE TECHNIQUE OF THE CAESAREAN SECTION.

By A. Palmer Dudley, M. D., of New York County.

October 9, 1894.

My object in selecting the operation of Caesarean section as a subject for discussion this evening was not because I wished to review an old subject so thoroughly and ably studied by Harris, Lusk, Garrigues, Lungren, and others, but simply to try and interest you for a few minutes by bringing to your attention the results of my work in the performance of that operation. For that purpose I have invited those upon whom it has been my privilege to operate to be present this evening.

My experience has been limited to three cases, all of which have been successful, saving the life of both mother and child. I consider this success largely due to my method of operating, and I wish therefore to call the attention of the Society, as the title of my paper indicates, to the technique of the operation, and lay stress upon what I consider to be some of the most essential features. As you may be aware, there is in the profession at the present time a difference of opinion as to the best method of delivering the child and of suturing the uterus, many operators claiming that to make a long incision and raise the uterus out of the abdomen before incising it, is the best, while others claim—myself among the latter—that such a procedure, although perhaps it is a saving of time, is attended by dangers which more than overbalance all that may be gained in time.

That I may not be misunderstood, and my effort be successful in clearly setting forth the points at issue, let us criticise the first method and note the dangers attending it, that of making the long incision and everting the uterus before incising it. To be sure, it is a saving of time at the expense of an enormous incision through the abdominal walls, extend-

ing from a point about an inch and a half above the pubic arch to one two and a half inches above the umbilicus, before the uterus can be readily lifted from its position. This can be quickly done, for when the abdomen is once opened, it is easy with scissors to extend the incision from one to the other of the points I have mentioned. The uterus is then lifted from the abdominal cavity, an elastic cord thrown about it, and to prevent the escape of blood and amniotic fluid into the abdomen through this large incision, a sheet of rubber dam is incised and stretched over the uterus (as was done by Dr. Coe in his last operation, and which I believe to be a most excellent precaution). Incision of the uterus and delivery of the foetus and placenta can now be accomplished to the best advantage to the operator, but at what an expense to the mother—provided it heals by first intention, an ugly-looking scar extending almost the entire length of her abdomen; certainly a weakened linea alba, and consequently much greater liability to the formation of hernia than if the incision had been that of an ordinary coeliotomy, especially if the person proves to be an unruly or careless patient.

No more apt illustration of this danger can be cited than that of Dr. Coe's recent case, who, from her own carelessness and negligence in obeying instructions, was obliged to submit to four abdominal sections, the first a Caesarean section, the second and third for hernia following the first, while the fourth was for the removal of a second pregnancy.

The second point at issue is the method of suturing the uterus. Here, as you well know, all operators have so far claimed that the use of interrupted silk sutures is the best, and practise that method. Why so? What advantages has this method over others, and why should interrupted sutures be advocated in preference to some others? Also, why cannot some other suture be used to just as good advantage? I believe I am justified in asking these questions from the results obtained in my own cases with the use of an entirely different suture and method of applying it.

I claim that the use of the continuous catgut suture, as applied by myself, has many advantages over the best method of interrupted sutures of silk, because (1) it brings the entire depth of the uterine incision into much closer apposition than does the interrupted silk suture; (2) it prevents the danger of leakage between the sutures and the formation of small blood-clots between the edges of the wound; (3) it shortens the wound very much; (4) it is a completely buried suture from beginning to end, with the exception of where the suture dips on the surface of the uterus, simply to catch the peritonaeum; (5) there is no necessity of rolling in the cut surfaces with this method; (6) there cannot possibly be any eversion of the lips of the wound; and (7) it is not more liable to be a septic suture when introduced, or to become septic afterwards, than is that of silk, if both are properly prepared.

It is claimed that catgut is a dangerous suture owing to the liability of the knot to untie, or the catgut to stretch and allow a gaping of wound. That opinion is justifiable respecting the suture when used as an interrupted one, but I am not advocating such a method. In a few short hours the abdominal surface of the uterine wound is covered with lymph and the peritonaeal cavity perfectly safe so far as that incision is concerned. In a short time, eight or nine days, the catgut is absorbed and the wound is a clear and healthy one, with perfect union. Not so with the use of silk; it is not absorbed, but must become encysted until Nature has had time to disintegrate the silk fibre and dispose of it in her own way. There is less liability of adhesions taking place between the uterine and abdominal walls in using the catgut suture, for the reason, as I have already stated, that the latter is so quickly covered over with lymph. The one point along the line where there would be any danger of adhesions taking place would be at the lower angle of the incision where the catgut is tied, and that, as the bladder is filled, is protected by the latter. Especially is this method of suturing advantageous in cases like my last, where it

becomes necessary to make the operation a second time. There is no danger of cutting down upon an encysted suture from the previous operation, as in the case of repeated Caesarean section reported by Lungren,[1] where he used silver wire sutures, and the second section of the uterus revealed an encysted suture of the first section.

As to the best time of doing the operation, some advocate waiting until labour had commenced if possible, in order to secure free drainage from the uterus by the os being dilated by natural labour pains; while others advocate the elective operation. Professor Garrigues, in his report of the first operation upon my third patient, in reviewing the subject, deems the best time for operation to be when labour pains have become strong and frequent, still I notice in the after-report of this case that he operated two weeks before full term. From my own experience, if it can be done, I believe in the elective operation, giving one plenty of time to prepare for it, and, so far as we are able to reckon the day, to make the operation at least four or five days previous to the expected natural delivery.

I have only a criticism to offer concerning repeated Caesarean section and its results. I refer you to the report of Dr. Coe's last case, published in the August and September numbers of the *New York Polyclinic*, in which he quotes the authority of Dr. Harris, of Philadelphia, as stating that there have been thirteen repeated Caesarean sections in the United States, with three deaths, one woman dying after her third section. In the twenty-five sections performed upon twelve women by fifteen different surgeons, the maternal mortality was accordingly 12 per cent., the foetal 28 per cent. I believe we should be governed largely by circumstances in the management of such cases, dependent upon the patient's walk in life, the history of hereditary disease, and the complications which may surround the first operation. In my first case I allowed the tubes and ovaries to remain, although in my judgment I should have removed them. In the two

[1] Amer. Jour. Obstet., 1881, p. 79.

remaining cases, although it is the only child they have, I considered it better to remove the appendages and did so.

A brief history of each case will be all that I shall attempt at the present time.

Case I.—A. D., aged 16, a dwarf from curvature of the spine in the lumbar region, height, four feet six inches; physical examination indicated that she was in about the fifth month of pregnancy; the pelvis showed marked deformity, and its various measurements taken at the time with as much care as possible, were approximately as follows: The brim of the pelvis was contracted antero-posteriorly; the width of the symphysis pubis was 2½ inches; distance between the tuberosities of the ischii 2¾ inches; from coccyx to inner border of the symphysis, 2½ inches; from anus to symphysis, 1½. The mother was told of the condition, and the dangers of inducing premature delivery were explained to her, and to that she strongly objected. Soon after this examination, arrangements were made for the patient, and she was sent into my service at Randall's Island hospital, where she was allowed to remain until she was at full term. During this time (nearly four months) her suffering was comparatively slight, and that from pressure of heart and lungs. On February 14, 1889, her labour commenced, and toward the next morning the sac ruptured and a portion of the amniotic fluid escaped. I was sent for at mid-day on February 15. The patient had then been in labour twenty-four hours, and the os had dilated to the size of a shilling. She was at once brought to the operating room, put under the influence of ether, and delivered in the manner I shall hereafter describe.

Case II.—This case presents an interesting history from the fact that it was her third pregnancy, two previous children having been born dead, the first after compression of the head sufficient to kill the child, although it was a small one, (after she had been twenty-four hours in labour, on May 28, 1890); and the second on August 6, 1891, craniotomy being performed only when it was deemed necessary to save the life of the mother. She did not consult a physician again until she was for the third time seven months pregnant. She gave the following history:

F., aged 26; she matured at 18, her menses appearing regularly every four weeks, but rather scanty, and continuing only one or two days; she married at 22, having enjoyed good health up to that time; her family history is negative. She expected to be at full term on February 11. I therefore anticipated natural delivery by four days.

The actual pelvic conditions which determined me to resort to the Caesarean section were as follows:

External conjugate diameter	6½ inches.
Iliac spines	7¼ "
Iliac crests	9 "
True conjugate (estimated)	2¾ "

Diagonal	3½ inches.
Transverse	3 "
Circumference of pelvis	29½ "

The patient made an uninterrupted recovery.

CASE III.—M. W., aged 26, born in New York city; so far as can be learned, her family history is negative; in early life she suffered from some form of constitutional trouble attended with the formation of abscesses about the pelvis. She menstruated at 14, with some pain; married at 18, and two years later, February 24, 1888, she was admitted to Charity hospital for delivery. Here it was discovered that she had a pelvis so deformed as to preclude the possibility of the delivery of a living child naturally. The measurements were as follows: The patient was 4 feet 9½ inches high; the pelvis measured between the anterior superior spines of the ilium, 7½ inches; greatest distance between the two cristae ilium, 8½ inches; Baudelocque's diameter, 6½ inches; between the posterior superior spines of the ilium, 2½ inches; between the trochanters, 10 inches. Vaginal examination revealed great narrowness of the transverse diameter of the whole pelvis, a narrow pubic arch, and a true conjugate little more than three inches. Caesarean section was performed by Professor Garrigues of this city, within two weeks of full term. (The child lived two years.) The long incision was made, and the uterus delivered from the abdominal cavity before being incised. The incision extended from within an inch and a half of the pubic bone to two and a half inches above the umbilicus. With the exception of some trouble with a gathered breast the patient made a good recovery.

She impregnated a second time about August 6, 1893, after a lapse of five years, and she expected to reach full term on or about May 14, 1894. The operation was made on May 10, anticipating natural delivery by three days. An incision was made through the abdominal walls about four and a half inches long. The uterus was found to be bound to the abdominal walls and intestines by numerous adhesions, one being especially firm, more than four inches broad and two inches long, extending from the site of the former incision to and involving the entire right broad ligament. This adhesion rendered it impossible to properly cast the elastic ligature about the uterus in order to control haemorrhage, and I was obliged to puncture the adhesion in its lower segment and carry the ligature through it and around the uterus; the uterus was incised in the median line, as in the former two cases, but a little to one side of the previous incision; the child was delivered from the uterus easily, but the adhesions prevented the delivery of the latter from the abdominal cavity to such an extent that I was obliged to rotate the uterus about the adhesion and deliver it side-ways from the cavity. When this had been accomplished and the placenta removed, the uterine incision was closed with catgut suture, both ovaries and tubes removed, and an attempt made to remove the broad adhesion between the side of the uterus and the abdominal wall. This occupied some time, but did not seem to complicate the result in any way. The incision was closed without

trouble, and it is needless to say that the patient made an uninterrupted recovery, the only rise of temperature being due to a gathering in the breast, which had troubled her at the former delivery.

The technique of the operation as performed by myself I have advocated since the performance of my first case in 1889, and this I claim is far superior to the improved Sanger operation. It is as follows:

The patient is properly prepared as for any ordinary coeliotomy. If possible the chloroform should be administered in preference to ether as rapidity in bringing the mother under the influence of the anaesthetic is quite essential to the well-being of the child. An incision is made through the abdominal walls sufficiently large to admit of an easy introduction of the hand and, so far as we are able to judge, to readily admit of the delivery of the child. An incision six inches in length, extending from a point one and one half inches below the navel to within an inch and a half of the pubic bone, is, I believe, quite sufficient. The hand and forearm are then introduced through the incision and swept about the uterus to note the position of any adhesions should they by chance exist. (The importance of this preliminary examination of the external surface of the uterus was aptly illustrated in the history of my third case.)

If no such complications exist, a loop of an elastic cord, such as I show you, is then grasped between the fore and middle fingers and quickly carried through the incision, over the fundus of the uterus and down to the cul-de-sac behind it. The ends are then given to an assistant, who is directed to make steady traction upon them and thus hold the uterus against the pubic arch. This serves a three-fold purpose, (1) it maintains the uterus firmly against the abdominal incision, and thus prevents leakage or escape of blood and amniotic fluid into the abdominal cavity; (2) it cuts off sufficient blood supply from the uterus to prevent haemorrhage when the uterus is incised, although not enough to cut off completely the circulation to the child; and (3) it acts as an assistance in delivering the uterus through the

abdominal incision as the child is being delivered from the uterus. The uterus is then quickly incised along its anterior surface without reference to the position of the placenta, until the foetal sac is reached. During this procedure, a second assistant makes firm pressure upon the abdominal wall from above downward and forward, his duty being to hold the upper portion of the uterus firmly against the abdominal incision; as the child is being delivered, he grad ually presses the uterus out of the abdomen through the incision as it contracts upon itself; all this work is done under constant irrigation with hot boiled water.

Some operators advise delivering the child by the occiput if possible, claiming that there is some danger of the uterus contracting around the child's neck and imprisoning the head in the pelvis; but I have so far been indifferent to the position of the child, delivering that portion of the foetus which presents first through the incision. In my first case, I grasped the child by the feet, in the second, by the head, and in the third it was the breech which presented. I lose no time in tying the cord; but quickly clamp it with two pairs of pedicle forceps and cut the cord between. While this is being done by myself, my assistant has pressed the uterus through the abdominal incision and surrounded it with hot aseptic towels. The irrigation of boiled water is now changed to one of bichloride of mercury, 1–5000, and the uterine cavity irrigated while the placenta is being detached. The stimulation of the hot water and the action of the bichloride upon the muscular structures cause the uterus to firmly contract. Still continuing the irrigation, the uterine incision is closed with three rows of catgut sutures, used as a continuous stitch; the first row beginning at the inner edge of the upper angle of the incision, and including the decidua and inner muscular coats of the organ. This row of sutures is continued to the lower angle of the incision under irrigation, and when drawn together they close the uterine cavity. Without cutting or tying the catgut, the second row is carried back to the upper

angle of the uterine incision including the various layers of muscular structure and uterine sinuses, care being taken to pass the needle through the cut extremities of all the sinuses that are visible. By these two rows of sutures three-quarters of the depth of the uterine structures have been brought into close apposition, and both layers of sutures are buried, while the third and last row of sutures must close the peritonaeal surface of the uterus and are not completely buried, but without cutting the catgut the stitch is passed so as to allow the catgut to just appear on the peritonaeal surface of the uterus; the over and over stitch being continued from above downward until the suturing is complete and the catgut tied at the lower angle of the incision. When this has been completed, the elastic cord is removed from about the uterus and the circulation allowed to resume. There may possibly be some oozing along the line of the cut for a few moments after the rubber ligature is removed, but in the cases I have operated upon not enough has occurred to require any ligating of vessels, the application of a hot sponge for a few minutes being quite sufficient to stop all bleeding. Bichloride irrigation is now changed for the hot boiled water. The uterus and surrounding abdominal walls are thoroughly cleansed and dried and the organ restored to its proper position in the pelvis.

In my last two cases I tied and removed both tubes and ovaries, and in neither case did the removal of the appendages in any way complicate the result. After the uterus is restored to its normal position, the pelvic cavity is thoroughly irrigated and sponged dry, for although I do not allow any blood or amniotic fluid to escape into the pelvis, I guard against the bare possibility by thorough irrigation of the latter for safety's sake; and I do not find, as some operators claim, that thorough irrigation of the pelvic cavity after coeliotomy is a dangerous procedure if care is taken to make a proper toilette of the peritonaeum afterwards.

The abdominal incision is then closed with three rows of sutures, two of catgut, as is my custom in all cases of

coeliotomy without drainage from above. I do not consider it necessary to vary the after-treatment from that usually carried out after any ordinary coeliotomy. The bowels are moved within twenty-four hours, and the mother is treated as though she had been delivered of her child *via naturalis*.

HYSTERECTOMY FOR UTERINE FIBROMA BY BAER'S METHOD, WITH REPORT OF NINE SUCCESSFUL CASES.

By Joseph Taber Johnson, M. D., of Washington, D. C.

October 9, 1894.

Case I.—Mrs. V., German, aged 34, mother of two children, was seen in consultation with Dr. Cannon. She had a fibroid filling the pelvis and causing great suffering from pressure on the pelvic organs. She was confined to her bed with a sharp attack of peritonitis, produced, it was thought, by a number of examinations made by consulting physicians, with hope of an operation. The tumor was situated so deeply in the pelvis that no one who had seen her thought it possible to form a pedicle, and an operation was declined. The condition of the patient demanded immediate relief, and I suggested the removal of the tumor by the method described and successfully practised by Dr. Baer, of Philadelphia, which requires no pedicle. The patient was removed to my sanatorium, and, after the usual preparation, the tumor, uterus, and appendages were removed down to the internal os. The abdominal incision was completely closed without irrigation or drainage, and the patient made a rather slow but good recovery.

One difficulty in this case was the imperfect carrying out of the various steps of the method,—too much tissue was left, and too many stitches and ligatures were put in to prevent internal haemorrhage. Sloughing occurred in the stump under the peritonaeum, and the patient had a bad smelling discharge for several days, which, fortunately, found exit through an already widely dilated cervix. She made a good recovery, and went home four weeks from the date of her operation, while six weeks is a short convalescence from operations done by the extra peritonaeal method with wire or clamp.

Not being satisfied with this operation, I sought an opportunity to see Dr. Baer carry out the technique of his method, and when case No. 2 was done felt more confidence in my ability to follow his description.

Having previously done thirty-four supra vaginal hysterectomies, with the stump always clamped externally, I felt somewhat strange in this new and dangerous field of work. The Trendelenberg position was of the greatest service in bringing the parts clearly into sight.

CASE II.—Miss B., white, single, age 32, was sent to my sanatorium by Dr. Stonestreet, of Rockville, Md. She had been suffering with a growing fibroid for a number of years, both from the effects of pain and haemorrhage. The tumor reached up to a level with the umbilicus, and down into the pelvis. The chief symptoms, which finally drove her to the operation, were the constant and increasing pressure on her bladder and rectum. In this case, also, I performed supra vaginal hysterectomy by Baer's method. The patient made a good recovery, and from a recent letter I learn that she continues well.

I had the very best opportunity to contrast the intra and extra abdominal methods of treating the pedicle in this case, as I had operated on Miss B.'s sister four years previously for a large fibroid, clamping the stump externally with a Koeberlee serre neud. The argument was entirely in favour of the Baer method, especially as the sister first operated on now has a small ventral hernia. Another peculiarity of this family, and one which I have not met before, is the fact that still another sister has a fibroid tumor of the uterus.

CASE III.—Miss D., white, age 27, was seen in consultation with Dr. S. S. Adams. The patient had a large fibroid, reaching half way between the navel and the ensiform cartilage. The most troublesome symptoms in her case were from partial suppression of urine—what little did pass was loaded with albumen. She also had some very queer mental symptoms, which caused her relatives to fear that she was becoming insane. Feeling sure that her kidney symptoms resulted from pressure, I proposed the removal of the tumor. She came to my sanatorium, and was operated on by the Baer method.

She made a good recovery, and is now able to do the work of two women. I saw her last week, and hardly knew her; said she had gained fifty pounds.

CASE IV.—Mrs. K., German, age 53. Has had three children, and one miscarriage. Had been bleeding for three years, and for the past eight months has been confined most of the time to her room and latterly to her bed. She had been treated by a number of able men, and curetted under chloroform in one of our hospitals. I saw her about the 1st of December, at the request of Dr. Mary Parsons, in a noisy boarding-house, suffering from the effects of a sloughing fibroid, the odour from which was horrible.

Upon examination I found a stringy portion of tumor protruding from the vulva. It looked and smelled like decayed placenta. This mass was easily removed with the fingers. She was already in a condition of septicaemia, and weakened also from long-continued haemorrhages. I feared she could not stand an operation; believing, however, that she

would soon die unless relieved, I took her to my sanatorium and did what Joseph Price calls a life-saving operation.

The vagina and cervix were thoroughly disinfected, the uterine cavity packed with iodoform gauze, and the Baer's operation was performed. Patient had a pulse of 130 and temperature of 102° at the time of the operation. She had a slow and troublesome convalescence, but is now quite well except from her old rheumatic pains, which still pursue her.

In none of these operations has the method had an unobstructed or fair chance. The complications and consequences have been so exhausting and unfavourable for any method that the successful results in these cases should be set down as more than usually creditable to this particular method.

In addition to the exhaustion of Mrs. K., in case No. 4, from loss of blood to an extent which threatened at times to be immediately fatal, her eight months in bed, and her septicaemia, she had a pyosalpinx on one side and a large dermatoid tumor on the other. I felt sure at the time that no other method offered so good a prospect of cure, and I am sure of it now. Another peculiarity worthy of notice is the age of this patient. The tumor has grown since she was fifty, contrary to the statement of the text-books and the views of many practitioners.

Some time ago, in a paper on fibroid tumors growing after the menopause, I drew attention to the frequency of the exceptions to this rule, and to the fact that it could no longer be good advice to sufferers from uterine fibromata to favour waiting for the change of life, with the promise that the tumor would go away. Baer, Gordon, Keely, and others, have recently drawn attention to this fact, and many cases have been reported of uterine fibromata, either starting to grow after a postponed menopause, or continuing to increase in size, sometimes more rapidly after than before the change of life occurred.

Case V.—Mrs. C., white, married, aged thirty-seven, mother of three children, last one ten years old; had been in good health up to about three years ago, when she began to be troubled with profuse menstruation. Gradually she lost more and more blood, until about a year ago she began to have profuse haemorrhage, not only at the time of her periods but in the interval between them. The exhaustion caused by

this loss of blood finally compelled her to remain in bed. I was called to see her in consultation by Dr. Caldwell, who had already discovered a fibroid tumor of the uterus, and had been treating it for some time. She had had an attack of peritonitis, and the abdomen was still so tender that a perfect examination could only be made a week or two later.

Electricity and all medical treatment failing to arrest the flow of blood an operation was finally proposed, and performed at the patient's house, on the second of January, 1893, in the presence of Dr. Caldwell and a number of other physicians. On account of the small size of the tumor I proposed at first to simply remove the ovaries and tubes, with the hope of arresting the growth of the tumor and checking the haemorrhage, but both the patient and her physician insisted on its complete removal. The Baer operation, as we call it, was successfully performed. It is doubtful if the removal of the uterine appendages would have availed in this case, as a section of the tumor after its removal showed a large vascular growth, projecting into the uterine cavity.

The patient made an uninterrupted recovery, had no pain and took no medicine. Indeed her convalescence was the most rapid and smooth and uneventful I ever had the pleasure to witness.

Case VI.—This operation was begun with the intention of removing the ovaries and tubes, for the purpose of checking severe and dangerous haemorrhages, which had resisted all other methods of treatment, including curettage and electricity, but on account of the severity of the haemorrhage I thought it would be safer to perform the Baer operation, which was accordingly done.

This patient also made a quick, smooth, and altogether beautiful recovery.

Case VII.—Mrs. G. came into my sanatorium with an unusually large fibroid, which had been growing and bleeding for fifteen years. Indeed, I was surprised, as this lady was a lecturer on Spiritualism and quite a traveller, that she was ever allowed to get as far south as Washington, with such a large and such a troublesome tumor. It came out easily by the Baer method, and, after considerable blood had drained away from it, weighed nearly fifteen pounds.

Alarming haemorrhage occurred when the tumor was cut away, and at the suggestion of a surgeon who was witnessing the operation I rapidly fastened an elastic ligature about the pedicle. I found as soon as I proceeded to remove the tumor that this delay had been unnecessary, as the loss of blood was just as great as before, indeed it all came from the tumor, and ceased of course with its removal. The color of the blood should have suggested its source and should have allayed instead of arousing fears that the uterine arteries had not been securely tied. Some of the blood vessels over the surface of this tumor and inside of it also, cut across in its removal, were as large as femoral arteries, and could no more have been dried up or closed up by electricity than could the veins and arteries of the arms and legs.

The electricity enthusiast has yet to explain to us the selective powers of this "subtle and mysterious agent"—how it is that under their wishes or control it skips over or through all the tissues of the abdominal or vaginal walls, the peritonaeum and viscera, attacks and dissolves hard inflammatory products in the pelvis, and solid fibroid tumors weighing ten to twenty pounds, supplied with nourishing blood conduits as large as lead pencils. That it temporarily allays pain, limits or stops for the time the abnormal flow of blood, and proves a reviving and sometimes an exhilarating tonic to the exhausted nervous system, we are quite ready to admit, but the sooner the profession throws off the shackles with which our electrical brethren have been trying to bind *us*, as well as the too confiding public, the better will it be for the welfare of our patients, and the credit of surgery.

Surgeons who have been allured after its sparkling brilliance and supposed glittering advantage over all things surgical are now joining with us in trying to improve the technique of hysterectomy. Even Keith has an excellent chapter in his recent book on this subject, and our beloved brethren who have been flying the conservative flag are among the most radical in advocating complete hysterectomy for the cure of double pus-tubes and uterine fibromata.

The patient above referred to made a perfect recovery, and recent advices report her in excellent health.

Case VIII.—Miss R, white, aged 32, single, in good circumstances; was brought to my sanatorium by Dr. Muncaster. She had suffered from a growing fibroid for several years. Hysterectomy down to the internal os was performed. Tumor weighed six pounds. Patient made a good recovery and went home four weeks from the day of her operation. She has had some abdominal pains of late, but whether they are intestinal neuralgia or the result of adhesions no one has yet been able to decide.

Case IX.—Mrs. C, wife of a naval officer, came to my sanatorium from Portsmouth, Va. She had been a great sufferer from pelvic pains and haemorrhages for three years. Had been treated by drugs and electricity without success. After admission she was thoroughly curetted under ether. Her next period was worse than any preceding one. She had an interstitial fibroid about the size of my fist, protruding somewhat into

the uterine cavity. She desired a radical operation before returning home, and readily consented to the removal of the tumor, and the uterus with it, if thought best. She already had two children and was not opposed to the effect of the operation, which was fully explained to her. The Baer operation was done, and notwithstanding the occurrence of an abscess, which opened through the incision in the abdominal wall, she made an unusually rapid recovery, and started for home four weeks after her hysterectomy.

Information received within a month is of her being perfectly well.

The report of these nine successful hysterectomies comprises my entire experience by the Baer method. It is not intended to open up the broad question of the surgical treatment of fibroid tumors of the uterus, or even to compare this method with total extirpation and the extra peritonaeal treatment of the pedicle by the wire clamp of Koeberlee. Any new method of treatment which supplants older or different methods, must, of course, be proved by experience to be the most successful in saving health and life, before it will be generally adopted to the exclusion of all other methods. These cases are presented for record to aid somewhat in elucidating this important question.

The cases reported by Baer himself were so successful as to induce me to follow his example, and so far only success has resulted from so doing.

The temptation is too strong to resist just to point to the more speedy, painless, and smooth convalescence of patients operated on by the Baer method than by the extra peritonaeal treatment of the stump by the Koeberlee wire. Baer's operation, or these operations somewhat like it, performed by Eastman, Dudley, Goeffe, Crobach, and others, all require more time and manipulation of sensitive and important viscera than is occupied in encircling the pedicle with the wire, and closing the peritonaeum under it.

Baer's operation requires less time and manipulation, however, than total extirpation and leaves the patient less mutilated than as if the cervix had been separated from the vagina and completely removed.

In cases where the cervix is suspected of malignancy, of

course it should be removed in toto—no one disputes the universal application of this rule.

In performing hysterectomy surgeons should not feel bound exclusively to one particular method. Circumstances differ so completely in different cases, that one cast iron rule of operating cannot safely be adopted for all cases. It is necessary to secure the best results for some particular patient even to change altogether or modify our preconceived and prearranged technique after commencing an operation.

The "unexpected" is so frequently found in abdominal surgery, that it behooves one operating in this cavity, to be like Mars, armed at all points. An operator might exhaust an aged, weak, or anaemic patient by prolonging his manipulations and mutilations sufficiently to totally extirpate the uterus in conformity to his rule or method, when this same patient might have survived the quicker and safer wire clamp operation as practiced by Bantock in London, and Joseph Price in this country. It is better to have one's convalescence prolonged two or three weeks, or even to have a ventral hernia, than to die on the table or within twenty-four hours while the various steps of some particular and unalterable method are being carefully carried out.

My feeling about this matter is that the Bantock-Price operation has, up to the present time, yielded the best results, in numbers at least, and that we cannot safely discard it. It has its drawbacks, but it also has its advantages. It is safer for the inexperienced surgeon. An expert may take his choice between total extirpation and amputation at the internal os.

HYSTERECTOMY IN PUS CASES.

By William R. Pryor, M. D., of New York County.

October 9, 1894.

Every surgeon who has had opportunity to do many coeliotomies for purulent adnexa, and who has studied carefully the after-effects of his work, must be convinced that too often has he failed to relieve his patients from all distressing symptoms. A brilliant operation has been performed and striking gross pathological specimens removed; he is satisfied with the result. But from the standpoint of the patient, is the operation a success? I can not give you precise figures, because I have been unable to follow all my cases, but I unhesitatingly state that at least a third of the cases from whom I have removed both adnexa containing pus, leaving the uterus behind, regret ever having undergone the operation. The reasons for this may become apparent further on. If an operator tells me that his results from bilateral salpingo-oöphorectomy are entirely satisfactory to his patients as well as himself, I can but say that he either does not operate upon the same class of cases as I do, or else that he possesses a most enviable degree of skill.

I do this operation not because it can be done successfully, but because of the persistence of symptoms after the old operation. In speaking on the affirmative side of this question at the last session of the American Gynaecological Society, I said: "I firmly believe that we get as good results from palliative measures—such as curettage, vaginal tapping, and so forth—as are obtained by a coeliotomy which leaves the uterus behind." This is still my view. Much sentiment is wasted upon the uterus deprived of its adnexa. It is styled a useful member, part of the body which belongs to the woman, a healthy organ, and what-not. The truth about

it is that a uterus which has been associated in and the first step to an inflammatory process severe enough to produce bilateral pyosalpinx, remains for very many years a mischievous, distress-producing organ. Once being deprived of the menstrual function, the uterus is no longer useful. I take the position that when such operative procedure must be

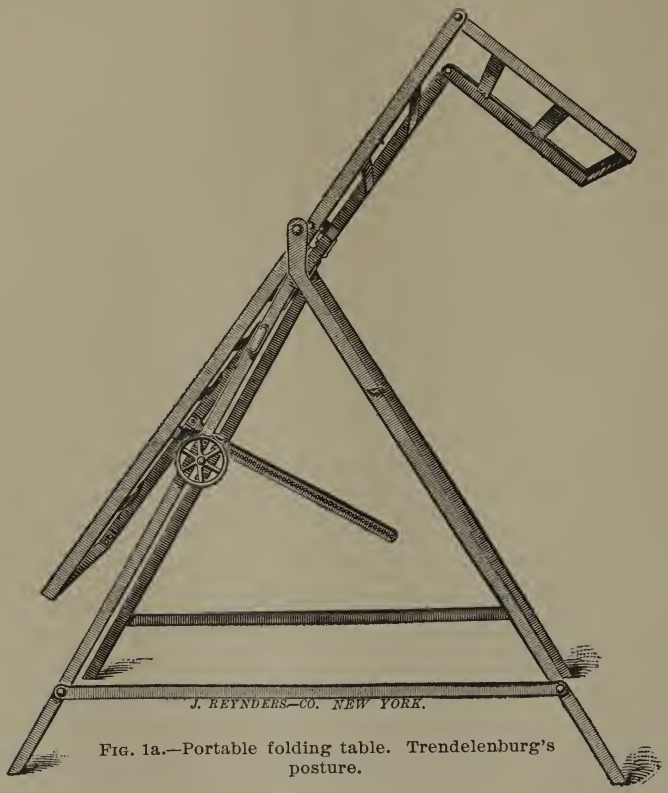


FIG. 1a.—Portable folding table. Trendelenburg's posture.

had as will bring on the artificial menopause, the woman were better without the uterus. Either preserve the menstrual function by conservative measures, or remove the uterus when the ovaries and tubes are taken away.

Throughout this entire article I feel inclined to write the refrain, "I speak of cases of tubal or ovarian suppuration

only," so persistently are we represented as taking out the uterus when associated with non-suppurative disease of the adnexa. So radical a procedure as ablating the uterus when apparently the adnexa alone are diseased will not commend itself to surgeons, unless it be theoretically approved and offers to the woman a benefit equal to or greater than that

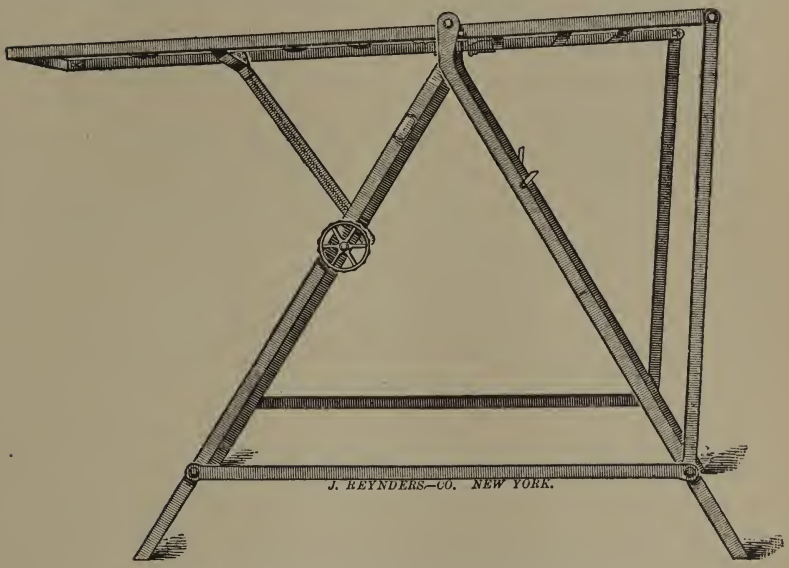


FIG. 2a.——For operations in the lithotomy posture.

which follows salpingo-oöphorectomy alone and with no increase in danger. For myself, let me disclaim the intention of ever attempting, and the almost crime of ever having performed, the operation of removal of the adnexa for *ovaritis*. It is utterly impossible for me to meet the men who do this operation upon any common ground. It is based upon a conception of the causes of pelvic disease and suffering far different from those which I entertain and is the rankest sort of extreme radicalism, utterly opposed to conservatism. I trust that I have made this repudiation of a procedure which should be discredited by the whole profession sufficiently plain. This is deemed necessary in view of repeated

statements that those of us who remove the uterus for pus-tubes and ovaries do so whenever we remove both adnexa, an expression which, while stating our practice, would lead the reader to infer that we ablate the uterus in non-suppurative cases and where others do simple salpingo-oöphorectomy. I can speak for the four men who most often, in this country, have done hysterectomy in pus cases, that they never do a salpingo-oöphorectomy for ovaritis or unless pus be present in tube, broad ligament, or ovary. Having stated my position, then, as that of one who is dealing with pus cases only, I may consider the merits of the operation.

	Number of operations.	Number of deaths.	Number with rectal openings.	Number of these latter that died.
Florian Krug	34	2	1	.....
J. M. Baldy	22	.....	.....	.....
W. M. Polk	20	1	1	.....
W. R. Pryor	9	.....	3	.....
Total	85	3	5	.....
Percentage of mortality	3.53 per ct.			

Dr. Baldy leaves a little of the cervical tissue, a modification of the operation which I think unnecessary, but which materially does not differ from the one I do.

The best reliable statistics of salpingo-oöphorectomy are those of Zweifel, he having operated upon one hundred and forty-two cases without drainage and with two deaths. In this statement he includes cases where one side alone was involved—a class of cases not included, of course, in the above eighty-five operations. Thus, ablation of the uterus in the worst cases gives a mortality of but 3.53 per cent.

I have previously reported myself thirty-two undrained cases of salpingo-oöphorectomy without a death. So much for the old operation. Naturally you question: Why, if the salpingo-oöphorectomy in pus cases is so safe an operation, change to another? In the answer to this query is involved the gist of the whole matter under discussion. The operation

of mere removal of pus tubes and ovaries, the uterus being left, was unsatisfactory, because—

1. The infection which originally caused the pelvic involvement came through the uterus, may persist after pus-tubes or ovaries are removed, and may recur from fresh exposure. This is especially true of gonorrhoeal cases, for a woman will return to the husband or lover who originally infected her. I have been compelled to repeatedly curette the uterus for such recurrent attacks of gonorrhoeal endometritis.

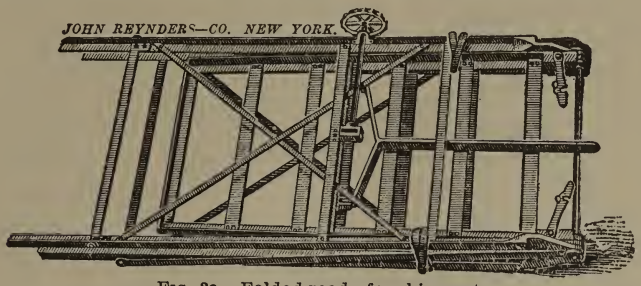


FIG. 3a.—Folded ready for shipment.

2. About twenty per cent. of pus cases are tubercular with tubercular uterus. Removal of the pus-tube or ovary alone leaves behind the tubercular uterus. I am familiar with the histories of not less than six cases which have become subjects of phthisis pulmonalis after pus-tubes were removed and the uterus left; cases with clean lungs at the time of operation.

3. Certain old cases, such as we find in our city hospitals, are so advanced in degeneration of tubes, ovaries, and broad ligaments that to remove all pus foci entails such injury to the uterus as renders it hazardous as well as useless to retain the mutilated organ.

4. Removal of pus cavities communicating with the bowel gave a mortality of seventy-five per cent. when the uterus was retained. Krug and Polk have each ablated the uterus in such a case with recovery, and I have removed the uterus in no less than three cases having bowel communications with pus sacs, all recovering.

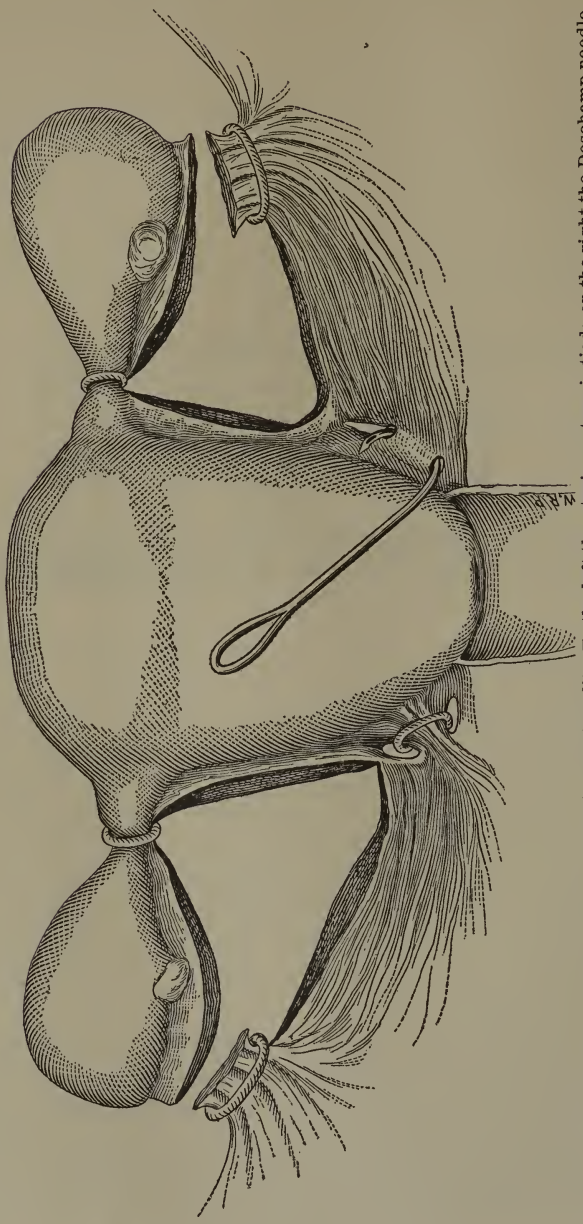


FIG. 1.—Ovarian arteries tied, and the broad ligaments split. To the left the uterine artery is tied; on the right the Deschamp needle is passed around the artery. (W. R. B.)

5. Liability to displacement of the unsupported uterus.

6. In long-standing cases, with perhaps years of suffering, the pelvic nerves are in a condition of chronic inflammation—true pelvic neuritis. The cervical ganglia are the largest about the uterus. They and their branches are alike inflamed with the other tissues of the uterus, the ovary and tube. Many patients who have had salpingo-oöphorectomy alone performed suffer as much, though in a different way, as before the operation. So great is this distress that many deplore the performance of what we consider a brilliant operation. The pelvic pain, the long dragged-out artificial menopause, and the backache render these patients utterly miserable. Bilateral salpingo-oöphorectomy done in recent cases does not give so large a percentage of failures to relieve symptoms, because the inflammatory processes have not become so deep-seated and have not produced the gross structural lesions found in older cases.

Any operation upon the purulent adnexa which leaves behind the inflamed nerves about the cervix does not give the measure of relief which is desirable. In marked contrast to these cases is the convalescence and future comfort of those cases of myomata with pus-tubes in which the organ has been ablated. And, so far as we have been able to observe our cases of removal of the uterus where both adnexa are purulent, the same relief from pelvic symptoms is found as follows the removal of the fibroid or malignant organ.

There is one class of cases in which I do not deem it necessary to remove the uterus with purulent destruction of both adnexa—where already atrophy of the genitalia has begun. Such cases we find in old prostitutes, in whom the uterus is little else than a small bundle of fibrous tissue, the atrophic changes of the menopause having taken place.

It is useless for critics to state that this operation can be done by those only who are particularly skilled in hysterectomy. We deny the attribute ascribed to us, however flattering it may be, and refuse to accept incompetency as an excuse

for rejecting the proper operation and doing another sim ply because easier. One thing has struck me as marked in all this discussion—*i. e.*, most of the opposition to removal of the uterus comes from those who spay for fibroids. Ablation of the uterus for pus foci is directly evolved from the same operation for fibroids, and capability to do one will give the operator the right to do the other. The personal equation can not be here eliminated. Men who get a prohibitive mortality from their hysterectomies for fibroids will, of course, not successfully do this operation; but they have no right to raise their voice against it or in support of it.

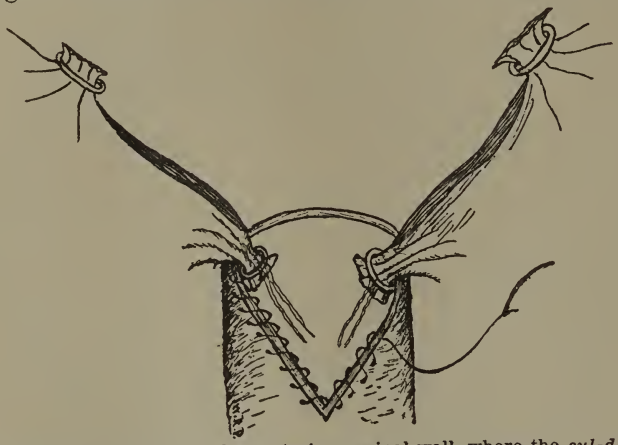


FIG. 2.—Method of splitting the posterior vaginal wall, where the *cul-de-sac* is deep. (W. R. P.)

Now these results I quote you are obtained in just that class of cases which gave us our mortality after the old operation—namely, very chronic cases associated with uterine fibrosis and those having communications between the bowels and pus foci. Objection is made that shock attends this operation and is absent in salpingo-oöphorectomy. The cases tabulated here cover every walk of life, from the woman of wealth to the tramp in delirium tremens. What force has this objection when the results are such?

But shock is not an attendant upon this operation. Very little blood is lost, and not a fraction of that bruising of living

tissue is produced which accompanies attempts to strip old adhesions from the uterus and pelvic walls. Except in cases of openings into the bowel, no drain is introduced from above, but the abdominal incision is accurately closed. I

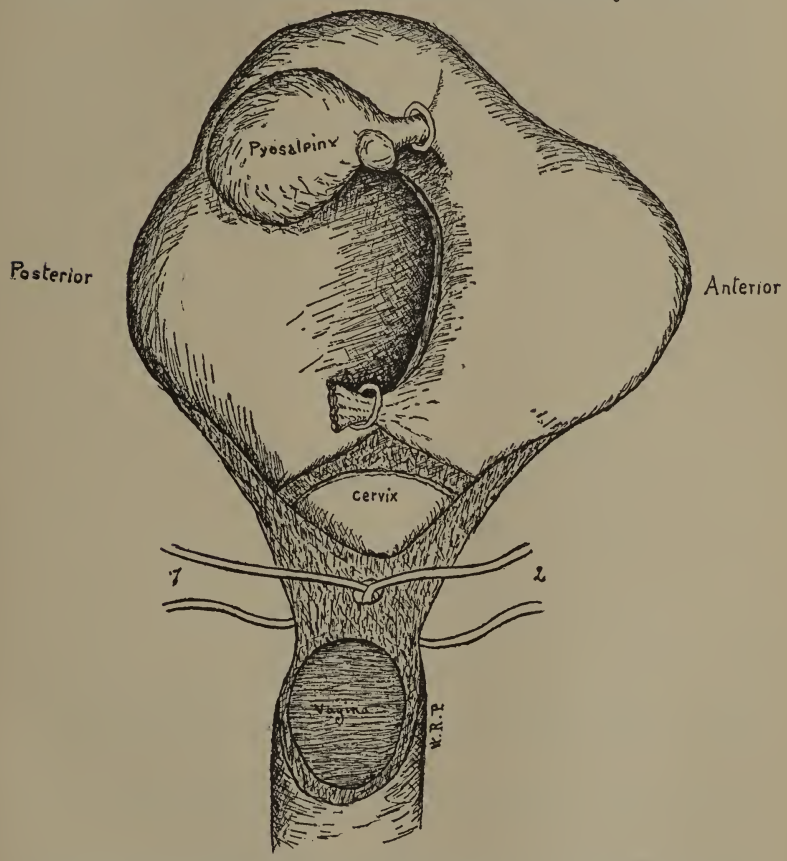


Fig. 3.—View from the right side, showing the method of transfixing thick pedicles containing the uterine artery and branches, and ligating by anterior and posterior ligatures. (W. R. P.)

always operate upon the table shown you. The operation is begun with the patient in the horizontal posture. With this table the patient can be thrown into the true Trendelenburg position and back to the horizontal without disturbing

the dressings or altering the height and relations of the field of work to operator and assistants, the abdomen being over the centre of the table.

The steps of the operation as I do it are as follows: The ovarian arteries are tied off and the broad ligament cut to the middle between two ligatures (Fig. 1). The vagina is entered either by separating the bladder from the uterus in front, or, as I prefer when I can do it, by opening the *cul-de-sac* and then separating the bladder and uterus. This leaves the uterus attached by two lateral strips of tissue only, in

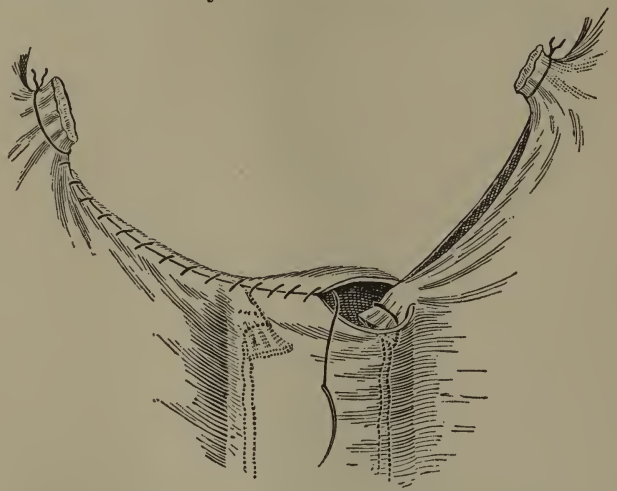


FIG. 4.—Total abdominal hysterectomy; vaginal vault in process of closure, with lower stumps drawn into the vagina. Opening in the left broad ligament closed.

which are the uterine arteries. The curved needle is now entered on the anterior face of the broad ligament and sweeps around the uterine artery (Fig. 1) and is tied. The same thing being done on the two sides, the uterus is cut away. The ligatures on the ovarian arteries are cut short, those on the uterine left long and tucked into the vagina. The vagina is packed with iodoform gauze from above and not closed (Fig. 5).

Done in this way, the operation is bloodless. I consider it a disadvantage to close over the top of the vagina with

sutures, as doing so furnishes the stumps with vitality and retards separation of the ligature (Fig. 4). If the *cul-de-sac* be deep, I cut it to the bottom and take a running suture along the edges to give better drainage (Fig. 2). Should the stumps of the uterine arteries be very thick, they may be transfixed and tied in two parts outside the ligatures already placed (Fig. 3). If there be an opening into the rectum, small and surrounded by a wide necrotic area, this opening is either closed by resecting a portion of gut, or else it is not closed at all but is so arranged as to lie immediately over the vaginal packing. The rest of the intestines are kept out of the pelvis by a Mikulicz packing, and the pelvis thus made practically extraperitonaeal. Should a fistula occur, it will be into the vagina and easily closed. I adopted this plan successfully in two of my cases. Provision is made for escape of faeces by dilating the sphincter and introducing a short, large cannula into the rectum.

In one case of communicating tube and rectum, I split the vagina down to the bottom of the *cul-de-sac*, as described, but made the cut to one side. The vaginal flap was sewed over the very large fistula in the gut. The patient recovered. Mikulicz packing was done here also.

I have attempted to show that this comparatively new operation gives results far better than the old, and with a very low rate of mortality. If I have succeeded in this, I cannot appreciate the value of further objection to it. Quoting Henrotin's words, the indications for palliative operations in these cases are:

1. Unwillingness of the patient to submit to radical procedures.

2. Inexperience of the operator.

Patients who will tolerate a section at all will endure this operation without increased danger. On the contrary, I think in a like class of cases it positively gives a lower rate of mortality than salpingo-oöphorectomy.

My longest operation occupied an hour and a quarter—the one in which I had to do elaborate suturing of the rectal fist-

ula. It takes less time to remove the uterus than to dig out pus foci and suture the remaining rents in the broad ligaments or pelvic walls.

I would ablate the uterus associated with bilateral suppurative diseases of the adnexa in all cases, unless the uterus be markedly atrophied.

FIG. 5.—Total abdominal hysterectomy; stump drawn into the vagina, and vagina opening packed with gauze.

I would ablate the uterus where one set of adnexa only are the seat of purulent foci, whenever there are myofibromata large or small; in all cases where the pus cavity opens into the bowel; in all cases where the large gut is accidentally opened into, if this opening can be brought down to the vaginal; in cases where drainage is thought necessary, because of the destructive effect of drainage upon the remaining tube; in cases of extra-uterine pregnancy communicating

with bowel or bladder, and when any pus focus opens into the bladder or vagina.

While studying this subject, and parallel with reading this article, I suggest that the surgeon read Henrotin's thesis on "The Vaginal Extirpation by Morcellement" in these cases. My objections to that operation are:

1. Once begun, there remains no possibility of employing consecutive measures.

2. For it to be indicated at all, there must be infallible skill to determine irremediable destruction of both adnexa or other indication for hysterectomy.

3. Whereas by it the uterus is removed, portions of the pus foci are easily overlooked.

4. Greater liability to inflicting injury on the hollow viscera.

5. And, far more potent than all other reasons, the effect upon the general economy of prolonged suppuration in a cavity so intimately associated with the absorptive system as is the pelvic. It should not be forgotten that one fifth of these cases are tubercular—locally, at least. Abdominal ablation removes the pelvic tubercular foci completely. Vaginal hysterectomy does so but partially, and makes great breaches in the surrounding tissues for absorption of the retained material.

In May, 1892, before ablation of the uterus for pelvic inflammation was discussed in America, this operation of removing the purulent uterus was advocated by me in post-partum cases. There the degeneration of the uterine walls can be seen. We now know that in gonorrhoeal and tubercular cases the uterine lesion, though less apparent, is just as prominent a cause of distress after the operation.

DISCUSSION.

Dr. MARCY said he believed thoroughly in Baer's method. Fourteen years ago he had operated by the same method, and had long ago published it. His plan was to close in everything by lines of buried sutures, so as to intra-fold the peritonaeum absolutely, and as a consequence leave a smooth, clean, uninjured peritonaeum covering the pelvic floor.

This was a great deal better than the removal of the stump of the cervix. The advantages of the method were many. First of all, it enabled the surgeon to deal successfully with a class of cases which could not be successfully treated by the older method of fixation in the abdominal wall. It was in just this class of cases where the tumor was so large as to fill the pelvis and not allow the proper formation of a pedicle that the method under discussion was peculiarly advantageous. Most of these patients were very glad that the uterus had been removed, and that there was no possibility of future trouble of this kind. Eastman believed in removing the whole uterus, but the speaker said he considered it better to leave the cervix as Dr. Johnson had suggested. He had also removed the uterus for pus cases in the manner advocated by Dr. Pryor, and he approved of this plan of doing clean surgery and of getting rid of all purulent foci. Above all he believed, where it was possible, in leaving the peritonaeum smooth.

He would like to ask whether there was not a possible danger in the use of the Trendelenburg position? The portal system was ample to contain the entire blood of the body. With patients in this position he had had two deaths which could be explained in no other way. He had found that the temperature had risen very rapidly to an extreme degree, and the patient had soon become pulseless, death occurring from fifteen to thirty hours afterwards—certainly long before the period when one could expect acute sepsis.

Dr. Pryor said that the time the patient was in the Trendelenburg posture was an important element. He knew of death having occurred in one case from the Trendelenburg position alone where it had been continued for a considerable time,—one hour and a half. His patient had had a normal temperature and a pulse of eighty-four entering the second day, and while naturally asleep she had suddenly become pulseless and her face had become dusky; in five minutes she was dead. In this case it had been impossible to procure a post-mortem examination immediately, and when it was made Dr. Van Gieson excluded everything else as the cause of death and stated that he believed the patient died from multiple (Rokitansky's) cerebral haemorrhages. He hoped there would be no cry raised against the Trendelenburg position on the ground of secondary haemorrhage, for that could be easily controlled by a proper application of ligatures at the time of operation. The position was an extremely important aid to the surgeon, just as the Sims speculum had been to the gynaecologist. He wished to emphasise the fact that where the uterus had been sufficiently diseased to cause the formation of pus-tubes, the uterus was so diseased that it should be removed if one would do thorough and clean work.

Dr. Cronyn said he had seen Baer's method performed twice. He did not think, however, the method should be attributed to Baer. In one of the cases the tumor was exceedingly vascular, and weighed thirty-six pounds. The Trendelenburg position was employed part of the time, but he had insisted upon altering the position because about the time of the

introduction of the Trendelenburg position into surgical practice he was sure he had seen death result from its use. He had also seen the Caesarean section performed, and he had been going to ask why it was not better to operate during labour, but Dr. Dudley had just told him privately that the bichloride irrigation furnished the necessary irritation. Dr. Pryor had stated that there was no shock, yet he must know that on section of the peritonaeum the patient became pale instantly, and the pulse for a moment became flickering.

Dr. JOHNSON said that of the three papers read to-night the most important was that of Dr. Dudley, in that it saved two lives instead of only one. Any one who had performed craniotomy would readily recall his state of mind at the time. One of the great advances made in abdominal surgery in this century was in so perfecting Caesarean section that craniotomy had almost become a lost art. He did not mean to say, however, that craniotomy was a crime, and that it should never be done.

The points in the technique seemed to him open to discussion. There had been quite a large number of Caesarean sections done without exposing the patient to the prolonged and extensive manipulation advocated by Dr. Dudley; nevertheless Dr. Dudley had produced his patients, and had proved therefore that he had been successful. It was well known that the less the manipulation and the shorter the operation, the better the chances of the patient in the long run. The evolution of this operation, in his opinion, should take the direction of simple education, by which he meant the use of the minimum amount of stitching, ligatures, and manipulation in general.

He had been pleased to hear the remarks of Dr. Pryor, for he had also been tormented by patients who had returned after having gone away apparently cured by the removal of the pus-tubes. They had certainly been cured of their pus-tubes. He had felt that if the uterus could be readily removed without unduly prolonging the operation, it would be desirable. He did not, however, wish to be bound down by rules; we should do in any case what seemed best for that particular patient. When these subjects were discussed, it was often claimed that it would be wiser for the average surgeon not to undertake these special methods. This was not as it should be; the surgeon should be able to adopt whatever method seemed likely to answer the purpose.

Dr. DUDLEY said, in answer to Dr. Cronyn's question, that his reason for doing the elective operation—*i. e.*, a few days prior to labour—was that in the majority of cases labour began at night, and if the pains were rapid and severe, the woman would become exhausted before the operator could prepare himself and assistants for an aseptic operation. He did not think anything was to be gained by waiting for the cervical portion of the uterus to be dilated by the natural pains, for there was quite sufficient drainage from the natural os if the uterus were left in a clean condition at the time it was sewed up. His last two patients had been operated upon two or three days before labour, and drainage had been

ample. The only precaution taken was to see that the membranes were removed from over the os.

He would answer Dr. Johnson's criticism by saying that he believed he could sew up the uterus with one continuous catgut suture, using three rows, as quickly as most men could put in a single row of interrupted sutures. The great advantage of this suture was that there were only two knots on the suture—in fact only one knot which appeared within the abdominal cavity, and that was the small one where the catgut was tied at the utero-vesical junction where no traction came. It was a mistaken idea to believe that the uterine scar would open with three rows of such sutures crossing one another at different angles. They were all put in on the stretch, and as the uterus contracted they assumed the normal position without tension. It was the fault of the operator if he introduced a septic suture. As it was so difficult to secure union of the linea alba, and hernia was so prone to follow, he strongly favoured the use of small incisions. Eventration the uterus had no advantage over incising it *in situ*. In the last case, this part of the operation only took eight minutes, notwithstanding the fact that the manipulations were prolonged on account of the necessity of breaking up the adhesions left after the first operation. The shock attending the removal of the uterus from the abdomen was quite as great as that from incising it and forcing it out of the abdomen, and certainly in the latter method the solar plexus was less exposed to injury.

Dr. Johnson had limited the discussion to Baer's method. There were certain cases where Baer's method was advantageous. It was certainly only a modification of an operation which he had advocated and described in 1883, and which was on record in the transactions of the county association for 1884 or 1885. He heartily agreed, however, as to the wisdom of choosing the method suitable for each case.

Regarding hysterectomy for pus-tubes, he would say that there must be a large number of black marks against men who had been doing this operation for twenty years and reporting their patients as *cured*. What had become of these women? He believed the uterus was a good support for the pelvic vessels, and that it had an office, even after the menopause, although it was not essential to life.

He had never used the Trendelenburg posture because when first advocated he had studied its disadvantages, and had come to the conclusion that it was dangerous. He believed that it might lead to heart failure, apoplexy, and to septicaemia from rupture of the tube and escape of the pus within the abdominal cavity.

Dr. J. E. JANVRIN, of New York county, said he wished to speak of the so-called Baer's operation. He believed that this method, which was announced just two years ago at the meeting of the American Gynaecological Society in Brooklyn, was a modification of the Goffe and Dudley operation, the only difference being that in ligating the broad ligament, Baer included simply the cervical arteries, whereas the former surgeons passed that ligature through the cervix, and included half of

the cervix with the cervical artery on either side. This would seem to be a very small modification of the operation, and not sufficient to entitle it to be considered an entirely different operation. He felt that it was much better to dissect the peritonaeum down from the anterior and posterior surfaces of the uterus, and in that way to cover over the stumps, and so entirely protect the intestines and peritonaeal cavity from the pelvic cavity. The paper did not consider the relative value of the two procedures. He had himself tried both methods, and he preferred to leave the cervix where he was convinced that there was no disease of the cervix. Where there was malignant disease of the cervix, or where fibroids descended far down into the cervix, the latter should be removed.

He had been very much pleased with Dr. Pryor's paper. The quoted statistics were excellent, and they came from the four men who had most frequently operated by removing the uterus where there were pus-tubes. He did not believe that there was always disease of the uterus when there was pus in the tubes. He would remove the uterus in these cases if he felt convinced it was diseased, or if during the operation of removing the pus-tubes and ovaries the peritonaeal covering of the uterus became so injured during the manipulations as to seriously affect its integrity. In short, then, if the symptoms were such as to lead the surgeon to believe that the uterus was diseased, then it should be removed; if, on the other hand, his idea was that there was little or no disease of the uterus, it was better surgery to leave the uterus *in situ*. He did not think, however, the removal of the uterus increased the risk of the operation to any extent.

THE SURGICAL TREATMENT OF INGUINAL HERNIA.

By Henry O. Marcy, M. D., of Boston, Mass.

October 9, 1894.

In order that we may the better understand the varying conditions presented in operative cases of inguinal hernia, I shall first ask you to review with me the anatomical structures in their normal development, and, for this purpose, I consider myself fortunate in being able to exhibit to you upon the screen photographic reproductions of the splendid illustrations from many of the distinguished masters of surgery,—Camper, Cooper, Scarpa, Cloquet, Langenbeck, Bourgery, and others. From this series we are taught, that which is daily demonstrated in the dissecting room, that the anatomical plan of construction of the parts in the transmission of the spermatic cord and vessels through the abdominal wall, is by a line so oblique that the intra-abdominal pressure is normally placed at or near a right angle to the axis of the inguinal canal. However singular it may seem, I do not remember to have found a single reference made to this anatomical disposition of the structures in its possible application to the cure of hernia. This is, very probably, because the reconstruction of the parts to their normal anatomical relationship was impossible without the use of buried sutures.

In the upright position, the weight of the abdominal contents is deflected forward by the promontory of the sacrum, in a way to lessen greatly the gravity pressure upon the pelvic organs. The recti muscles form a strong supporting column with their basic anterior pubic attachment. Muscular strain, brought to bear with any degree of violence upon the abdominal wall, causes a deflection of the compression force in nearly equal degree from the promontory of the sacrum, upon either side, to the aponeurotic attachment of the mus-

cles to the pelvic bones. Thus it will be seen that, when the normal conditions pertain, this force must ever act in right lines to the inguinal canals. Were it not for this, it would be difficult to understand why the normal condition of man,

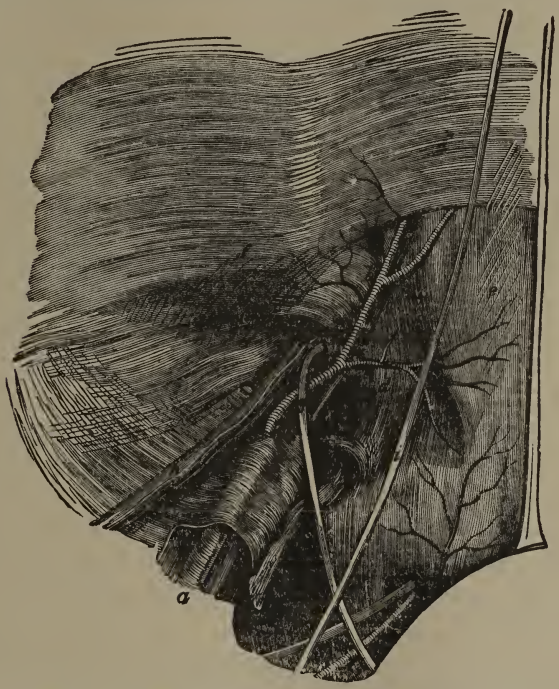


FIG. 1.—Dissection of internal inguinal and femoral rings from internal surface, the peritonaeum having been removed. *a*, external iliac artery; *b*, epigastric artery, branch of *a*; *d*, deep circumflex iliac, lying in Hesselbach's triangle; *c*. rectus muscle; *f*, fascia transversalis; *g*, vas deferens or spermatic duct; *h*, spermatic duct; *h*, spermatic flexus of veins with artery and nerves; *i*, obliterated cord of hypegastric artery; *k*, lymphatic glands. At the external ring may be seen subperitoneal fascia l enveloping the cord *h*.

as an upright animal, should not be that of a hernial protrusion of the abdominal contents along the lines of a necessarily open inguinal canal.

The reproduction of the wonderful dissections which we have been considering demonstrates these facts, but perhaps we are more deeply indebted to Sir Astley Cooper than to any other for pointing out this remarkable provision of

nature for the production and maintenance of this normal equilibrium of function and retaining force. He demonstrated that the transversalis fascia lying immediately beneath the peritonaeum was normally so reënforced and strengthened as to form a strong posterior wall to the inguinal canal, and that it also, by the dissemination of its fibres about the cord, made a firm boundary to the internal ring, thus producing a fixation point of definite character for the exit of the cord from the abdominal cavity.

Tracing the developmental forces during the late foetal period, we note the interesting and remarkable process of extrusion of the testicle from the abdomen, and the carrying with it the peritonaeal covering investing its vessels and vas deferens, making up the so-called spermatic cord. Normally, the peritonaeum is so closed in, about these structures at its exit from the abdomen, that only by pulling upon the cord do we note the slight depression upon the peritonaeal surface which lines the abdomen at this point. Not seldom, however, in individuals who are not subjects of hernia, the transversalis fascia about the internal ring is more open than normally, and the peritonaeum, shutting in about it, is left in a considerable depression. Indeed, this condition exists so frequently that it has received the name of the Infundibular process of the peritonaeum. These are the conditions which are very commonly present as predisposing factors in all subjects of hernia.

Remembering the disposition of the intra-abdominal pressure as noted above, it is easy to understand that, when this condition exists, there is brought to bear upon the depression, in every movement of the body, a more or less powerful hydrostatic pressure upon this weak point, acting as a wedge, until at last the equilibrium of the forces is so disturbed that, little by little, the parts yield, the internal ring enlarges, the inguinal canal is by thus much shortened; until by some extra force the external structures suddenly give way and the man finds himself ruptured—that is, a portion of the abdominal contents has become displaced through an abdominal opening.

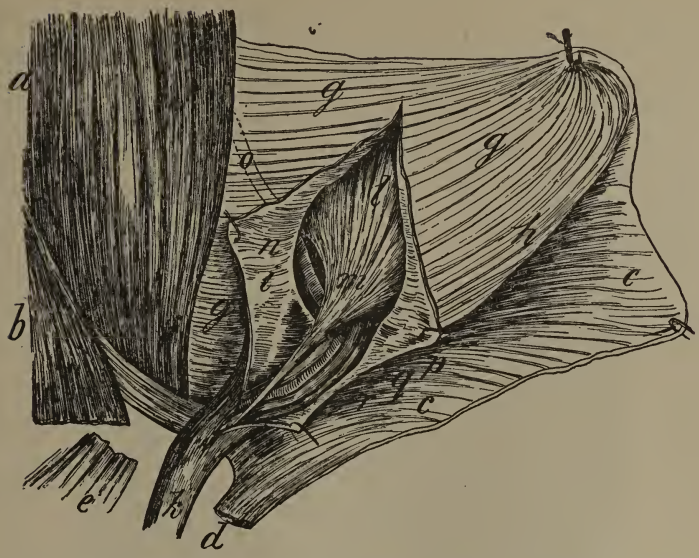


FIG. 2.—The prolongation of the peritonaeum; infundibular process, which sometimes extends in front of the spermatic cord.

a. The rectus abdominis muscle of the left side dissected.

b. The pyramidalis muscle.

cc. The tendonous aponeurosis of the external oblique muscle, dissected from its attachments, and reflected downwards upon the upper part of the thigh.

d. The internal and superior pillar of the external abdominal ring, cut from its connections with the body of the os pubis, and reflected downward with the rest of the aponeurosis of the external oblique muscle, of which it forms a part.

e. The corresponding portion of the internal and superior pillar of the external abdominal ring, occupying its natural position in front of the os pubis.

f. The outer border of the tendon of the rectus muscle, where it is continuous with the inner, or pubic, portion of the fascia transversalis.

ggggg. The fascia transversalis, where it lines the inguinal region.

h. The fascia transversalis blended with the posterior edge of Poupart's ligament, so as to form with it the floor of the inguinal canal. The fibres of the internal oblique and transversalis muscle have been dissected from their attachments to the iliac portion of the crural arch and wholly removed.

i. The funnel-shaped sheath of the transversalis fascia, laid open in front to display the compound structures of the spermatic cord, which it encloses.

k. The funnel-shaped sheath of the fascia transversalis, where it invests the spermatic cord, between the external abdominal ring and the testis; behind this portion of the cord are observed some oblique fibres, which constitute the triangular ligament of the inguinal canal.

l. *A portion of the great sac of the peritonaeum.*

m. A tubular process of the peritonaeum, which is frequently to be found as a fibro-cellular band in front of the rest of the structures composing the spermatic cord; it consists of the obliterated portion of the original processus vaginalis peritonaei.

n. The epigastric artery, as it passes deeply into the subserous cellular tissue between the fascia transversalis and the peritonaeum, and along the pubal side of the internal abdominal ring.

o. Dotted lines, which serve to indicate the course of the epigastric artery, as it ascends in an oblique direction behind the fascia transversalis in its way toward the umbilicus.

p. The spermatic veins. *q*. The spermatic artery. *r*. The vas deferens.

s. The triangular ligament of the inguinal canal.

I have presumed to occupy thus much of your attention in the consideration of the normal anatomical relations and functions of the parts involved in inguinal hernia, because this knowledge is especially important to the surgeon who, by operative interference, expects to secure a permanent restoration of the weakened structures, rather than to qualify himself only for the relief and restoration of the abdominal organs in strangulation.

FIG. 3.—Dissection from the peritonaeal surface of the parts affected by an oblique rupture; peritonaeum, its fascia and the transversalis fascia are removed. The sack is cut off at its neck in the deep ring. The epigastric artery is seen below the neck, but has been removed at the inner side to show the conjoined tendon *h*.

The time at my disposal prevents a careful analytical discussion of the varying conditions which may be met with in the cases presenting themselves for operation, but assuming that we may favourably consider the subject of a hernia, who is otherwise healthy, a proper applicant for surgical relief, we will take first into consideration those cases coming to us in infancy and childhood, the larger number of which will

be of the congenital variety. Here it is well to remember that we have no hernial sac proper with which to deal; in other words, the scrotal pouch of the peritonaeum, containing the testicle, is in direct continuation, as an open canal, with the abdominal cavity. We find usually that the opening in the transversalis fascia is very large, and the surgical procedures are not unlike those recommended for the restoration of the obliquity of the inguinal canal in cases of acquired hernia, after the peritonaeal sac, containing the hernial contents, has been sutured and resected.

The dissection is commenced at a point a little above the internal ring, and is carried down sufficiently far on a line with the cord to expose clearly the internal ring. The structures over the cord are divided so that the latter can be elevated and clearly expose the border of the internal ring and the posterior wall of the cord. Either by finger, or some convenient instrument, an assistant holds the cord, freed from its attachments, towards the middle line with sufficient tension to define clearly its relationship with the deeper structures. This is done in order that a clear field may be had for the application of the sutures for the reënforcement and reconstruction of the posterior wall of the canal. For the accomplishment of this, it is absolutely essential to use sutures, which are buried in the structures and are, as a consequent, beyond the power of the surgeon for subsequent removal. By general consensus of opinion, silk, although it may be used as a buried suture, is not considered applicable for this purpose. For somewhat similar reasons silk-worm gut proves unsatisfactory, because both of these materials, not being absorbed, are liable as sutures to prove irritants, and, in the subsequent muscular strain of the parts, are thrown off as foreign bodies. Good chromicised sterile catgut may serve as a trustworthy material for suture, but for a considerable variety of reasons, which cannot be referred to here, it has proved far inferior as a buried suture to that of tendon, preferably that from the tail of the kangaroo.

The way in which the suture is applied for the reënforce-

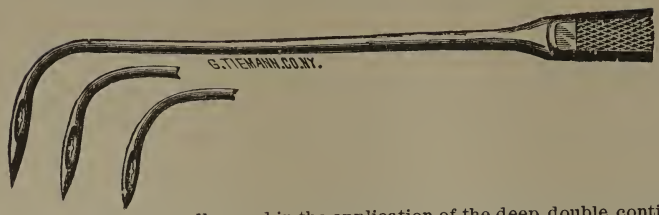


FIG. 4.—Dr. Marcy's needle, used in the application of the deep double continuous tendon suture. The eye is large and smooth, and a slot extends in both directions, so as to catch and hold the suture from slipping.
The point and inner side are rounded, to prevent cutting the tissues.

ment of the parts, and the structures to be included for this purpose, vary considerably. I have felt for a long time that a double continuous suture is to be preferred, and for this reason devised the method of sewing in which the suture is applied by the use of a curved needle with eye near the point. The first stitch is taken by entering the point of the needle through the lower border of the attachment of the conjoined tendon and the inferior posterior border of

FIG. 5.—Inguinal hernia showing the first stitch for the closure of the internal ring from below upward, in order to reform the inguinal canal.

Poupart's ligament. The needle is unthreaded, the suture centered and tied in a half knot, the needle rethreaded with the opposite end of the suture and withdrawn through the opening made at its entrance. Continuous sutures to the number of three or four are applied in this way, until the last stitch closes firmly the inferior border of the internal ring quite upon the cord at its exit from the abdomen. The last

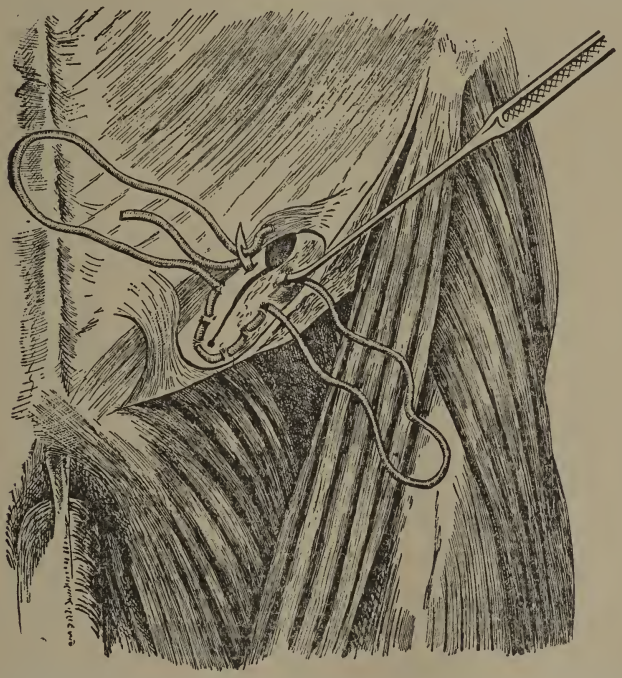


FIG. 6.—Inguinal hernia, showing the manner of closure of the internal ring, with the double continuous tendon suture. The needle is re-threaded for withdrawal.

stitch taken, the suture is tied upon the side and the ends cut short. It must ever be remembered that the object of the suturing is to hold the structures in even approximation without tension, and the chief danger from suturing lies in an *undue constriction* of the tissues. When properly applied, it will be observed that the transversalis fascia has been reënforced by the attachment of the posterior border of

Poupart's ligament to the posterior border of the conjoined tendon, thus forming a new strong wall of the inguinal canal. Into this slit the cord is replaced and the external structures are joined so as to make a firm, strong closure of the parts over the cord. For this purpose buried tendon sutures are equally desirable. These may be applied, as already described, by a line of double continuous suturing, reforming the external ring by bringing together the outer border of Poupart's ligament and the conjoined tendon.

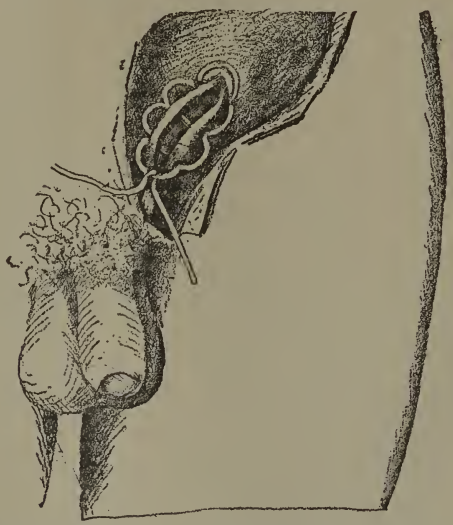


FIG. 7.—Represents the line of external sutures loosely taken, uniting Poupart's ligament to the conjoined tendon.
The spermatic cord is seen beneath the sutures, escaping externally below the knot.

For one who does not possess a needle as above described, the single continuous suture, applied with a curved Hagedorn needle, answers very well. The first stitch should be fixed by a reef knot, and the needle is then inserted at a more or less considerable distance from the line of the division, but taken deeply through the aponeurotic structures on a line *parallel* to the incision. The needle is then introduced exactly opposite its former emergence through the structures upon the other side of the parts to be approximated, and in

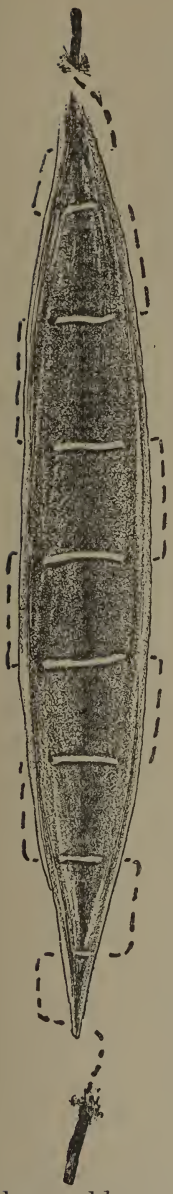


Fig. 8.—Fine continuous tendon suture taken evenly through the deep layer of the skin only, as a blind running stitch, which upon tension evenly coapts the skin by buried sutures.

this way one stitch follows another to the end of the wound. It will be noted that tension upon the suture evenly intrafolds the edges, the suture itself, buried in the tissues, crossing the line of division only at right angles. In this way the line of union is very much deepened, and may be easily more than doubled, greatly reenforcing the structures adjacent to the canal. Another layer of sutures, similarly applied, approximates the soft parts, and a line of running sutures, taken through the deep layer of the skin only, closes the wound. This is dried and sealed with iodoform collodion. No subsequent dressing or bandage is applied. The tunica vaginalis testis is thus reformed, and the peritonaeum closed securely about the internal ring so as to leave no depression.

The opposite extreme, the old large herniae in the adult, requires little deviation from the method described, except that the sac is first dissected free from its attachments, opened, to be assured of its contents—which may be disposed of as judged best, and then, quite within the ring, the sac is freed from adhesions and made tense by an assistant. The base is sewed across with a double continuous suture in a line with the axis of the wound, and the sac is resected. The retraction should be quite sufficient to place it out of the way in the subsequent steps of the operation, which are as above described in infantile hernia.

For teaching purposes, I like best the large old scrotal herniae, where trusses have proved inad-

equate for the retention of the abdominal contents, since the various steps of the operation can be made more easily apparent.

Inguinal hernia in the male has ever been considered the most difficult of treatment, since the opening in the abdomen must be closed in a way to permit the passage of important structures, which, at the best, can add nothing to the support of the parts. In the seventeenth century it was found an easy matter to cure inguinal hernia, by first removing the cord, and great numbers of hernia patients were deliberately castrated as a means to this end. More recently, before an open dissection wound was considered permissible, a great variety of ingenious subcutaneous devices were applied for the purpose of cure, but were usually followed by failure. Since it has been possible to make and maintain wounds in a non-infectious condition, the advance towards the permanent cure of hernia has been rapid, until, in the very recent years, new methods of cure are being constantly brought before the profession. However great in variety of detail, they must all be based upon a very few fundamental principles, and in order the better to emphasise these, I have occupied so much of the time with the consideration of the normal anatomy of the parts involved.

Of course the *ideal* method is to restore the parts to the normal standard of construction; pathological deformed structures having been removed,—*e. g.*, sac and contents. To do this, it is necessary to restore the obliquity of the inguinal canal by the reconstruction of the internal ring, and to reënforce the posterior wall. To effect this, a free dissection must be made, and buried sutures must be used. It was for this very purpose, so far as the records of surgery show, that buried sutures were first employed. I had just returned from Europe and the instruction of Mr. Lister, and was familiar with the use of the buried animal ligature for the closure of arteries. It seemed a proper application of the principle that sutures might, in like manner and with like result, be buried in the tissues. For this purpose I first

used catgut in 1870, which, prepared in various ways, I continued to use until 1880, when I made an extended search for some better material of like histological structure. These investigations resulted in finding the exceptionally valuable tendon suture material from the tail of the kangaroo. I demonstrated, histologically, that aseptic connective tissue, buried in healthy animals, is at first surrounded by leucocytes, that the foreign material is invaded by them, that little by little new connective tissue of a permanent character replaces the implanted suture. Since then I have used tendon sutures almost exclusively.

It has been demonstrated that other material may be used for sutures, and that it may be applied in quite a variety of ways. These variations in detail and technique have been called *methods*, and have been presented under different names,—*e. g.*, that of Bassini of Italy, perhaps, the best known. He uses an over-and-over continuous catgut suture, and places the coapted conjoined tendon and Poupart's ligament behind the cord. Potempski thinks it important to carry the internal ring to a higher point than normal. Fowler modifies this procedure by carrying the internal ring nearer to the median line, while Halsted thinks it wise to cut away a part of the veins in order to reduce the size of the cord, and, as a consequent, the size of the canal. It remains to be seen how much additional value comes from these modifications; if the liability of the return of the hernia is lessened, and if, by such extreme measures, the function of the reproductive organs is not impaired.

It is ever honourable and pleasant to associate the name of the individual with the contribution of real merit which he makes as an addition to the store of the world's knowledge. However, little by little, names given to operations, after the individual by whom they were established, sink into forgetfulness, and wisely so, that they may not overburden our literature, but the plain underlying principles must ever be kept in mind as the true foundation of all present and future improvement.

For the cure of hernia by a restoration of the structures to their normal anatomical standard and relationship,—and is it probable we shall find a better?—I introduced the use of buried animal sutures, which have been since widened in their application to all aseptic wounds. I demonstrated that a new oblique inguinal canal could be safely made and maintained: that the entire wound could be closed by buried sutures and sealed with collodion without drainage; and that primary repair ensued without pain or oedema. I also showed that ninety per cent. of my cases remained permanently cured; all this before any of the modifications as above referred to were published.

Whatever may be their advantages remains for others to determine. I know the reënforcement of the structures posterior to the canal is ample, if the inner border of the conjoined tendon and Poupart's ligament are joined to the relaxed, but strongly developed, transversalis fascia. This fascia is very much thicker in this region, as was pointed out by Sir Astley Cooper, and for a long time, on this account, called the *fascia Cooperi*.[1] Often its intrafolding is all that is requisite to give a firm and durable support.

The introduction of animal sutures, aseptically buried in the tissues for a very great variety of purposes, especially the possibility by their use of the closure of the peritonaeum and the reconstruction of the inguinal canal for the cure of hernia, I offer as a contribution to American surgery. It is with much satisfaction that I find these surgical measures are now so very generally adopted throughout the civilised world.

Before closing, there are a number of practical considerations which are offered for discussion. Of these perhaps the first in importance is, When shall we operate?

[1] Muscular fibres may be traced behind the cord, as if the canal entered through a slit in the transversalis muscle. "The transversalis muscle arise from Poupart's ligament and passes around the spermatic cord at the internal ring, so that the fibres of this muscle appear behind as well as before the spermatic cord, and thus the inguinal canal is rendered a muscular canal. This is a most important provision in preventing hernia; and when hernia exists, is often the cause and seat of stricture." *Sir Astley Cooper.*

At present I suppose there are few surgeons who would dissent from the proposition that, in strangulated cases, always at the first moment practicable. Any attempt at reduction should be made with exceeding care, and after such efforts have failed, immediate operation must be advised.

Operative measures for the relief of strangulated hernia vary essentially from those earlier advised, in that the dissection is a free one and is always under visual guidance: that blind surgery is bad surgery can nowhere receive greater emphasis than in the operation for the relief of strangulated hernia.

The hernial contents having been disposed of, few operators would now consider their work complete without closing the structures in some of the ways advised for the purpose of permanent cure. The earlier attempts made to utilise the sac for the reënforcement of the opening—as, for example, the Macewen method—are now very generally abandoned, since the reënforcement of the structures posterior to the cord, in a very much more satisfactory manner closes the weakened parts.

Hernia in children.—Until a moderately late period, nearly all this class of little sufferers have been relegated to the instrument makers. However, every surgeon is painfully familiar with the fact that it is exceptionally difficult to secure the proper wearing of a retention apparatus, and that, at the best, the cure of hernia by these means is tedious, painful, and unsatisfactory. The earlier attempts at cure of hernia by dissection and suturing were in large measure unsatisfactory, because of the use of the interrupted suture, which had to be removed, and the extreme difficulty of keeping the wound aseptic on account of the application of the drainage-tube. It is painful to recall the punishment of the little sufferers because of the multiple aseptic dressings, sometimes held in place even by plaster bandages. With all the care possible, the great majority of the wounds became infected, dangerous, and far from satisfactory in results.

The closure of the parts, as already described, with the

seal of collodion, renders further infection impossible, and primary union supervenes without pain or oedema, resulting almost invariably in permanent cure. It is pitiable in the extreme to send a boy, rich or poor, into the race of life suffering from hernia, handicapped with the necessary wearing of a truss.

Hernia in adults.—It may be considered an open question if active, vigorous men who are the sufferers from small herniae, easily retained by a truss, should be subjected to a surgical operation. The expense incident thereto, the loss of a number of weeks during which they must abstain from business, are set over against the inconvenience of wearing an instrument, the probability of the hernia continuing to grow more troublesome and pronounced, and the ever possible danger of strangulation. For my own part, I think the balance of account is usually in favour of operation, and I cannot question that the profession is each year becoming more and more of this opinion.

Hernia in the aged.—As at other periods, the problem must always be considered as one of individual character. This becomes more especially so in the later years of life. Assuming that the hernial subject is free from organic disease, age *per se* weighs far less seriously as an adverse consideration in aseptic surgery than was earlier supposed. Primary repair of the tissues is almost certain to ensue with remarkably little constitutional disturbance. The contrast between septic and aseptic wounds is much more marked in advanced life, and aseptic surgery wins, perhaps, its most brilliant victories in the operative wounds upon the aged. I have operated upon a very considerable number of patients between seventy and eighty, under the most unpromising conditions, and even upon several between eighty and eighty-five, and in each instance with seeming easy cure.

In illustration, I cite a recent interesting case, and exhibit the specimens.

Mr. M., aged 71, a hard drinker, had for a very long period suffered from an old irreducible scrotal hernia of the right side. It had recently

enlarged until the tumor extended quite one third to the knee and measured about eighteen inches in circumference. An inconsiderate truss vender had applied a strong-spring instrument upon the neck of the sac, and such inflammation had supervened that it was thought dangerous to permit delay in operation. The tissues were echymosed, and the sac was found to contain about a pint and a half of straw-coloured serum and a fatty omental tumor size of adult fist, with basic attachments. The omentum was sewed across, resected, and returned within the abdomen. Several pints of ascitic fluid escaped from the canal, which readily admitted three fingers. The sac was dissected, sutured, and removed. The wound was closed, as already advised, and sealed. The man was found to have chronic nephritis, albumen, and casts, jaundiced to a limited extent, which grew steadily more marked, and twenty-six days after the operation death took place.

The autopsy showed an interstitial hepatitis, liver reduced to half the normal size, with advanced disease of both kidneys. The union of the abdominal wound was primal, and I take pleasure in inviting your critical inspection of the specimens. The omental stump is smooth, and the cut ends of the tendon suture are apparently unchanged. The peritonaeum of the base of the sac is firm and glistening, showing only the slight wavy line of union. The reconstructed abdominal wall is noteworthy deep and strong, nearly one third thicker than upon the opposite side, owing to the intrafolding of the tissues. The skin wound is marked only by a linear cicatrix. The fatty tumor of the omentum is exceptional, seeming on section to bear no trace of intrafolded compressed omentum, of which it is doubtless composed; the thick, firm, leathery sac can even now be dilated to the size of a baby's head.

It will be noted that even in this aged man, dying from a complication of chronic diseases, the repair processes, under aseptic conditions, went on uninterruptedly, precisely as in a young, vigorous adult.

Multiple operations.—Individuals with hernia, suffering from various other conditions demanding surgical interference, may be, as a rule, safely operated on at the same time. It is usually advisable to operate upon both sides at once when the hernia is double, the repair processes going on equally well, with a marked saving of time and confinement. I have even operated upon double inguinal and umbilical herniae at the same time, with an equally easy convalescence and recovery. Multiple wounds, if aseptic, demand little more from the vital powers during the process of repair, and there is much positive gain to the patient in time, expense,

and confinement. Multiple operations have long been almost of daily occurrence in my surgical practice.

If operative measures are so generally advised for this disablement, it must be that the surgical procedures are attended with very little risk of life. Upon this subject the testimony is ample, and perhaps no other operation demonstrates more clearly the differences of result obtained under modern aseptic technique. Nearly twenty-five years ago, when I first commenced operation for the cure of hernia, it required persuasion to secure the presence even of physicians, because of the responsibility incident to personal attendance. So general was the belief—and, unfortunately, on altogether too good evidence—that an open dissection wound, made for the cure of hernia was always dangerous, that operation was not advised except in cases of strangulation.

In my recent work upon hernia,[1] I have collated over three thousand operative cases of hernia by various aseptic surgeons, who report less than one per cent. of deaths, and these explained by conditions in which the wound itself had no part. In my entire experience of over two hundred cases, I have never seen a patient approach the danger line following operation where the intestines were not involved.

He who is master of aseptic conditions may safely operate for the cure of hernia, if he is thoroughly conversant with the anatomy of the structures. *Aseptic sutures, aseptically applied in aseptic wounds*, and aseptically maintained. This is the *sine qua non*, or failure will ensue; otherwise buried sutures are not to be commended in any wound, and must ever be a source of danger.

In how large a percentage of cases may we expect permanent cure?

Upon this question there has been and still is a great variety of opinion, based upon the results, of course, obtained from the various methods of operation in use. We can well understand the opinion as given by Dr. Bull, of New York,

[1] The Anatomy and Surgical Treatment of Hernia. Illustrated. Quarto. D. Appleton & Co. 1892.

that relapses were the rule rather than the exception, when we remember that the results of the operations which came under his observation were due to methods which failed to secure the restoration of the obliquity of the canal, or the

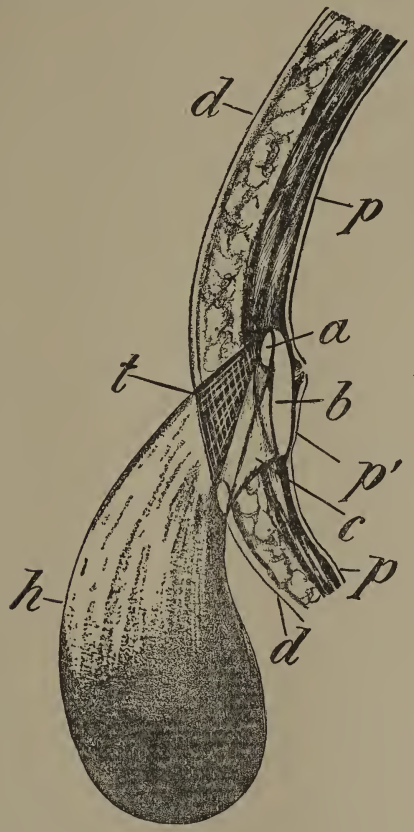


FIG. 9.—The light-colored funnel-shaped opening in the abdominal wall, is the part unclosed by surgical methods which do not reconstruct the obliquity of the inguinal canal.

a. Normal internal ring.
b. Enlarged internal ring.
c. Unclosed triangle.
d. Abdominal wall.
h. Hernial sac.
pp. Peritonaeum.
p^1. Resected at site of internal ring.
t. Triangle, reformed by closure of external pillars of the canal.

reënforcement of the deep structures. The removal of the sac and the suturing of Poupart's ligament to the conjoined tendon, without the reformation of the inguinal canal, necessarily left a large funicular opening in the abdominal wall, the very end of which only was closed at the external ring. Under such conditions, it is usually only a question of time before the hernia reappears. (See Fig. 9.)

In 1893 I read a paper before the American Medical Association, in which I gave the analysis of one hundred and thirty-three cases which I had been able to keep under observation; of these there were six recurrent herniae, four of which I have since operated upon. About one third of this number had been under observation for ten years and more.

Did time permit, I would gladly quote from the experience of some of the recent operators, of whom, perhaps, none are more enthusiastic at the present than Dr. Bull himself and Dr. Coley, of your city.[1]

Corroboration of the principles and position which I have advocated so long is now ample, and there is little question but that the more serious sufferers in the great army of truss-wearing individuals will early receive from the surgical profession easy and safe curative measures. In this field aseptic surgery has won one of the most brilliant victories of the present revolutionary period.

[1] From a recent letter by Dr. Wm. B. Coley of New York I quote. "I have used kangaroo tendon in 170 of my 183 cases of hernia, and have never had any trouble from it; and I believe my success was largely due to using it as a buried suture material. No other results, here or abroad (except, perhaps, your own), show such a percentage of immediate or final cures. Of my 140 cases where the cord was transplanted, I have had but one relapse—137 cases traced. In 170 cases where kangaroo tendon was used, suppuration occurred only four times,—and then superficial, outside the layer sutures of tendon."

THE DIFFERENTIAL DIAGNOSIS OF TRAUMATIC INTRACRANIAL LESIONS.

By Charles Phelps, M. D., of New York County.

October 9, 1894.

In a paper read before this Association two years ago, I indicated the comparative facility with which it is possible to diagnosticate cerebral traumatisms from morbid conditions of internal origin, and also recognised the difficulty of discriminating various encephalic injuries from each other.[1] Since that time additional observations and analyses of their results have served to broaden the diagnostic horizon. I submitted then an abstract of one hundred and twenty-four cases. I can now add to these one hundred and seventy-six others which I have since noted, a total of three hundred, of which one hundred and thirty terminated in death and were made the subject of necropsy.

These additional cases may be summarised, as were those previously recorded,—

I. *Fractures involving the base:*	
Recovered	36
Died	59
Number of necropsies	52
II. *Fractures confined to the vertex:*	
Recovered	31
Died	12
Number of necropsies	7
III. *Intracranial injuries without fracture:*	
Recovered	21
Died	17
Number of necropsies	13

[1] A Clinico-pathological Study of Injuries of the Head. New York Med. Jour. January 14, 21, 28, 1892; also, vol. 9, Transactions.

The consolidation of the two series affords an aggregate of:

I. *Fractures involving the base:*	
Recovered	57
Died	108
Number of necropsies	87
II. *Fractures confined to the vertex:*	
Recovered	52
Died	22
Number of necropsies	17
III. *Intracranial injuries without fracture:*	
Recovered	28
Died	33
Number of necropsies	26
Total number of recoveries	137
Total number of deaths	163
Total number of necropsies	130

In accordance with a more restricted purpose, I shall confine myself primarily to the abstraction of essential symptoms in the fatal cases, and to their attendant lesions as verified by necropsic inspection. In order to make this synopsis complete in itself, I shall reproduce, in connection with these recent histories, an epitome of the analogous cases included in the former series.

The temperatures quoted are rectal; and haemorrhage is denominated cortical when derived from laceration of the surface of the brain, pial when occasioned by rupture of the pial vessels in meningeal contusion, and epidural when situated between the dura and the skull.

Fractures Involving the Base.

Case I. *Symptoms.*—Wild delirium; high temperature; coma; haemorrhage from left ear; death in forty-eight hours.

Lesions.—Laceration of both parietal lobes upon their lateral and inferior surfaces; cortical haemorrhage.

Case II. *Symptoms.*—Active delirium only noted; walking case. Suicide by drowning after twenty-four hours.

Case III. *Symptoms.*—Coma, stertor, general muscular rigidity, and dilatation of left pupil; haemorrhage from right ear, and later from right nostril; left hemiplegia after twelve hours, with disappearance of earlier symptoms; urine not controlled; consciousness not restored. Death in six days.

Lesions.—Laceration of inferior and external surfaces of left frontal and of right temporo-sphenoidal lobes; corresponding cortical haemorrhages thinning toward base and vertex; general hyperaemia.

Case IV. *Symptoms.*—Semicoma, mild delirium, imperfect articulation, with slow and irregular respiration, which continued for three days; paralysis of right upper extremity and of right upper and lower face, differing in degree at different times; mental condition varying from normal to one of noisy delirium; patient usually restless, and during last two days unconscious. Temperature on admission, 101°; during first week, 100°; in second week, 99°+; and rose steadily from 103° to 109° through last two days. Death in forty-five days.

Lesions.—Subcortical laceration beneath the site of depressed fracture, external to right parietal eminence; subarachnoid serous effusion; general hyperaemia.

Case V. *Symptoms.*—Stupour; gradual unconsciousness; delirium requiring mechanical restraint. Temperature on admission, 102°; ten hours later, 105°; declined to 101.8°, and then rose steadily to 106.6°. Death in twenty-nine hours.

Lesions.—Laceration of inferior surface of left frontal and of both temporo-sphenoidal lobes, and of inner border of right frontal lobe; pial haemorrhage over upper surface of both hemispheres; general hyperaemia.

Case VI. *Symptoms.*—Stupour; incoherence; dilatation of left pupil; slight deviation of eyes to the right; second day—delirium, muscular tremor, irregular pupils, frequent and intermittent pulse. Temperature on admission. 103°; five hours later, 102°; and rose to 106.2°. Death in twenty-four hours.

Lesions.—Laceration of inferior surface of left frontal and temporo-sphenoidal lobes.

Case VII. *Symptoms.*—Stupour; irregular pupils; general muscular rigidity; ataxic gait; diminished sensibility, and loss of urinary control. On the fourth day, temperature normal, mind clear, and muscular rigidity lessened; copious serous discharge from right ear, and right facial paralysis; on the fifth day, increased muscular rigidity and recurrence of stupour; on the sixth day, unconsciousness and frequent general convulsions. Temperature on admission, twenty-four hours after injury, 99°+; on the fourth day, normal; on the fifth day, 100°+; on the seventh day, 105°. Death on the seventh day.

Lesions.—Contusion of surface of right occipital lobe posteriorly, with minute haemorrhages and softening; laceration of inferior surface of both frontal lobes, and of right cerebellum; epidural haemorrhage over both occipital lobes beneath the site of an extensive depressed fracture; cortical haemorrhage over inferior surface of cerebellum and beneath the situation of the epidural haemorrhage, where it was firmly coagulated and surrounded by plastic inflammatory exudation; thrombi in superior longitudinal sinus and torcular Herophili, and in right lateral and inferior petrosal sinuses and jugular vein; subarachnoid serous effusion over parietal and occipital lobes.

Case VIII. *Symptoms.*—Coma; stertor; muscular rigidity of both sides, most marked on the right; strong contraction of both pupils, but more marked in the left; no change in general condition till death, fifty-four hours later. Temperature on admission, 100.4°, rising progressively to 103.8°; declined post mortem.

Lesions.—Laceration of anterior border of left temporo-sphenoidal lobe and of the anterior and internal borders of both frontal lobes; cortical haemorrhage covering the whole base of the brain; subcortical laceration with clot occuping the whole interior of the left frontal and temporo-sphenoidal lobes, and filling with blood both lateral ventricles and both occipital lobes; slight epidural haemorrhage at point where fracture began in right inferior and posterior parietal region; slight subarachnoid serous effusion; thrombus extending from torcular Herophili through right occipital and inferior petrosal sinuses into the jugular vein.

Case IX. *Symptoms.*—Partial consciousness for twenty-four hours; became complete; haemorrhage from both nostrils and from right ear; delirium on the fifth day with post-cervical muscular rigidity, restlessness, and retraction of the abdomen; Cheyne-Stokes respiration and death. Temperature for three days, 99.2°; on the fourth day, 103.2°; on the fifth day, 104.8°.

Lesions.—Laceration of antero-inferior border of left frontal lobe and of inferior surface of right cerebellum; cortical haemorrhage covering superior and external surface of left cerebrum; general hyperaemia of the left hemisphere with punctate extravasations.

Case X. *Symptoms.*—Partial unconsciousness and left hemiplegia, followed by irritability; haemorrhage from left nostril. Death in twenty-four hours.

Lesions.—Epidural haemorrhage over left temporal region beneath a separation of the coronal suture; laceration of the right frontal, right parietal about the fissure of Rolando, and of left temporo-sphenoidal lobe.

Case XI. *Symptoms.*—Coma; stertor; pulse 70, respiration 7; dilatation of left pupil and contraction of right; paraplegia; haemorrhage from left ear and nose and under left conjunctiva. Death in five minutes after admission.

Lesions.—Large pial haemorrhage, mainly at the base; blood still fluid; slight lacerations of inferior surface of left frontal and temporo-sphenoidal lobes; slight cortical haemorrhage from frontal laceration.

Case XII. *Symptoms.*—Right hemiplegia; lack of control of urine and faeces; slight haemorrhage from nose and left ear; temperature on admission, 99.8°. Death in two days.

Lesions.—Laceration of left parietal lobe beneath parietal eminence.

Case XIII. *Symptoms.*—Coma; stertor; pupils, pulse, and respiration normal. Death in five days.

Lesions.—Pial haemorrhage over both cerebra; laceration of inferior surface of left temporo-sphenoidal lobe.

Case XIV. *Symptoms.*—Patient momentarily unconscious, then walked to the hospital in a dazed condition, and afterward walked home. Severe cephalalgia for three hours, followed by gradual supervention of coma, which became complete in four hours. Death in eight hours.

Lesions.—Large pial haemorrhage over external aspect of left frontal and parietal lobes; slight epidural haemorrhage beneath fine linear fracture upon right side; slight contusions of brain substance.

Case XV. *Symptoms.*—Coma; dilatation of right and contraction of left pupil; right hemiplegia; pulse became slower and respiration more laboured. Death in nine hours and a half.

Lesions.—Large epidural haemorrhage from rupture of left middle meningeal artery; slight laceration of left parietal, and of lateral border of right temporo-sphenoidal lobe.

Case XVI. *Symptoms.*—Unconsciousness, followed by stupour; slight but increasing dilatation of left pupil; slight haemorrhage from left ear; rigidity of left side; laboured respiration; later, complete left hemiplegia; temperature, 101.2°. Death in twenty-one hours.

Lesions.—Laceration of inferior and lateral surfaces of right temporo-sphenoidal lobe and slighter lacerations of inferior surface of frontal lobes along the median fissure; extensive cortical haemorrhage over right cerebrum; general hyperaemia.

Case XVII. *Symptoms.*—Unconsciousness; right hemiplegia; dilatation of right and contraction of left pupil; full and slow respiration; normal pulse; supervention of stertor; death in eleven hours.

Lesions.—Extensive epidural haemorrhage from rupture of left middle meningeal artery; general hyperaemia, with minute coagula and punctate extravasations.

Case XVIII. *Symptoms.*—Unconsciousness for thirty minutes and subsequent irritability; haemorrhage from right ear; second day, somnolence, continued irritability, and lack of urinary control, and temperature 102°; third day, delirium, temperature rising to 105.4°; fourth day,

moderate dilatation of the pupils, restlessness, hyperaesthesia, increase of surface temperature, followed by deep coma; temperature, 104°+ in the morning and 105°+ in the evening till death, at the end of the seventh day, when it rose to 106.5°.

Lesions.—Deep laceration of lateral border of left temporo-sphenoidal lobe; cortical haemorrhage over left occipito parietal region; cavity in right parietal lobe beneath point of fracture and opening upon the surface; subarachnoid exudation of thick pus over right posterior parietal and occipital lobes and in right inferior occipital fossa; general hyperaemia and punctate extravasations.

Case XIX. *Symptoms.*—Permanent unconsciousness; irritability when disturbed; dilatation of both pupils, especially marked in the right; profuse haemorrhage from left ear, which continued for twenty-four hours, and was then followed by serous discharge; general convulsive movements, most pronounced in the right leg; temperature, 100°; pulse, 80; single general convulsion, most violent on the left side, on the second day, and repeated on the third day; temperature rose steadily to 107.2°. Death in three days, six hours.

Lesions.—Large epidural clot in left middle fossa; large and deep laceration of the lateral surface of left temporo-sphenoidal and of lateral and inferior surfaces of right temporo-sphenoidal lobes; small and deep laceration at right parieto-occipital junction; large cortical clot in left middle fossa; thin cortical coagulum over right cerebrum.

Case XX. *Symptoms.*—Unconsciousness and muttering incoherence when disturbed; subconjunctival haemorrhage at outer part of left eye; slight temporary rigidity of right arm; restlessness and irritability; little change till death, in seven days ten hours. Temperature on admission, 101°; in two days rose to 104.8°, declined from fourth to sixth days to 101°+, to 102°+, and then rose progressively to 107°+.

Lesions.—Subcortical laceration of left frontal lobe, completely excavating and filling its interior with clot and disintegrated brain tissue and enclosed by a thin layer of cortex, except at the base, where it was covered only by the meninges; laceration of anterior two thirds of external border of right cerebellum; extravasation of blood of the size of a robin shot in the centre of the right corpus striatum; slight cortical haemorrhage over posterior part of the right cerebrum.

Case XXI. *Symptoms.*—Unconsciousness and delirium; haemorrhage from mouth and nose; mental condition in twelve hours became normal; slow pulse; laboured respiration; rigidity of arms, especially of the right; normal pupils, followed by restlessness, muttering delirium, lack of urinary control, and unconsciousness; temperature, 104.8° to 106°. Death in twenty-four hours.

Lesions.—Laceration of superior surface of both frontal and both parietal lobes.

Case XXII. *Symptoms.*—Coma; stertor; full pulse; pulmonary oedema beginning before admission; haemorrhage from right ear; death in two hours.

Lesions.—Epidural haemorrhage over both hemispheres, and another of larger amount in the inferior occipital fossae compressing the pons and medulla; slight lacerations of inferior surface of both frontal and and right temporo-sphenoidal lobes, with some cortical haemorrhage.

Case XXIII. *Symptoms.*—Unconsciousness; restlessness; coma nearly complete on fourth day; pupils, pulse, and respiration normal; temperature on fourth day, 102.2°; on fifth day, 103° to 106°; on sixth day, 107°. Death in five days and a half.

Lesions.—Laceration of external surface of left frontal and left temporo-sphenoidal lobes, with consequent cortical haemorrhage.

Case XXIV. *Symptoms.*—Unconsciousness; persistent vomiting; haemorrhage from left ear; moderate dilatation of pupils, especially of the left; temperature, 98.7°; second day, restoration of consciousness, delirium; third day, wide dilatation of both pupils, which were only slightly responsive to light, the left continuing to be more markedly affected than the right, and this condition permanent; sixth day, mind clear but apathetic, followed by stupour with paresis and anaesthesia of all the extremities, more marked on the right side; later, left foot and right hand less paretic, mind clear, but senses blunted, some right facial paralysis, cephalalgia, rapid and feeble pulse; ninth day, delirium and recurring unconsciousness; eleventh day, patient neither spoke nor moved, nor was conscious of pain or external irritation; on the fifteenth day, death. Temperature below 100° till fourth day, when it rose to 103°, and then varied from 100° to 102° till the twelfth day, when it rose to 104°, and was afterward from 103° to 104.5°.

Lesions.—General hyperaemia with minute coagula and excessive oedema; slight lacerations of inferior surface of right temporo-sphenoidal lobe and one somewhat larger upon its external surface; very moderate cortical haemorrhage extending over right occipital lobe.

Case XXV. *Symptoms.*—Stupour; haemorrhage from right ear; lack of control of urine and faeces; condition alcoholic; second day, active delirium, muscular tremor, delusions, and intervals of unconsciousness; sixth day, coma, stertor, muttering delirium, general muscular rigidity, slight contraction of right pupil, and slight right facial paralysis; eighth day, two slight convulsions, involving arms, face, and eyes, followed by paralysis of right arm and face, and elevation of surface temperature of left side; right side normal, left side 102°. Death on the eighth day. Temperature till fourth day, 100° to 102°; afterward 103° to 104° till eighth day, when it rose to 105.6° and declined to 104.8°.

Lesions.—Thin layer of pial haemorrhage, covering both parietal and both occipital lobes, and meningeal hyperaemia; large subarachnoid serous effusion; general oedema of brain substance and minute vessels

filled with coagula; fluid blood in anterior cornu of left lateral ventricle; small lacerations of superior and external surface of right frontal and of left occipital lobes and on either side of median fissure of cerebellum.

Case XXVI. *Symptoms.*—Vertigo and feeling of illness; haemorrhage from right ear and nostril; temperature, 100°; soon followed by haematemesis, coma, and stertor. Death in four hours.

Lesions.—Epidural haemorrhage, compressing right frontal lobe laterally; slight pial haemorrhage on either side of the anterior columns of the medulla; extravasations into the pons in both transverse and longitudinal fibres, the largest a half by a quarter inch in diameter; general hyperaemia with punctate extravasations and coagula in the minute vessels.

Case XXVII. *Symptoms.*—Coma; stertor; frequent weak and irregular pulse; slight haemorrhage from right nostril; protrusion of both eyes and dilatation of both pupils, especially of the left; rigidity of right side. Death in eight to ten hours.

Lesions.—Epidural haemorrhage in right occipital fossa; small laceration of inferior surface of left frontal lobe anteriorly; cortical haemorrhage over both frontal lobes.

Case XXVIII. *Symptoms.*—Paresis of left lower extremity; temperature, 98.8°; fourth day, temperature suddenly rose to 99°+, to 102°; fifth day, delirium; temperature, 105.2° to 106°; death.

Lesions.—Laceration of inferior surface of left temporo-sphenoidal lobe; cortical haemorrhage, filling left middle fossa.

Case XXIX. *Symptoms.*—Coma; stertor; dilatation of right pupil, left invisible from ecchymosis; anaesthesia followed by paralysis of right upper extremity; pulmonary oedema; second day, urinary control lost, mind clear, pupils normal, motor and sensory function restored; fifth day, gradual increase of temperature, subconjunctival haemorrhage noted; sixth and seventh days, mental condition apathetic, subconjunctival haemorrhage increased; eighth day, sudden unconsciousness, and on the ninth day, death. Temperature on admission, 101.6°; fifth day, 103°; sixth day, gradually declined to 100°; eighth day, 104.8°, and rapid decline to 102.8°; ninth day, 106°.

Lesions.—Subcortical laceration, disintegrating and filling with clot the interior of both frontal lobes; on left side the median surface ruptured through the arm centre and gyrus fornicatus, and the lateral ventricle invaded; deep laceration of external border of left cerebellum; internal brain structure softened and reddened in patches of limited contusion.

Case XXX. *Symptoms.*—Unconsciousness which continued till death; slight haemorrhage from both nostrils; left pupil dilated; right contracted; loss of control of urine and faeces; face flushed; on the last day of life general sensation markedly diminished. Temperature on admis-

sion, 101°; till next day, 101°+, then rose progressively to 106.8°. Death in three days and a half.

Lesions.—Deep and wide laceration across inferior surface of left cerebellum; laceration excavating inferior surface of right frontal, extending into temporo-sphenoidal lobe; laceration of middle portion of gyrus fornicatus, half an inch in diameter; anterior fossae filled with firm clot, three fluid ounces by measurement; cortical haemorrhage in right posterior fossa around foramen magnum, and also over right frontal lobe; general contusion of both hemispheres, most marked posteriorly.

Case XXXI. *Symptoms.*—Brief unconsciousness, which recurred in the ambulance; in the interval no evidence of serious injury; on admission pupils contracted, sudden cyanosis, and death in twenty-five minutes.

Lesions.—Epidural haemorrhage over left occipital lobe; pial haemorrhage in inferior occipital fossae, compressing the medulla; cortical haemorrhage over both frontal and both temporo-sphenoidal lobes from laceration of their inferior surfaces.

Case XXXII. *Symptoms.*—*Primary*: Consciousness retained; haemorrhage from right ear; no general symptoms; temperature, 100.4°, and afterward normal. *Secondary*: On the twentieth day some lethargy and frontal headache; twenty-third day, severe frontal headache, delirium, somnolence, and left hemiplegia; twenty-fourth day, complete left hemiplegia and hemianaesthesia, insensibility of both pupils, continued somnolence, normal mental condition when roused, temperature, 98.5°, pulse 56, cicatrix of wound firm and uninflamed; twenty-fifth day, patient roused with difficulty, action of bladder and rectum unconscious and involuntary, temperature, 100.2°; operation and evacuation of pus, one to two drachms, from subcortical abcess, beneath the angular gyrus. Temperature rose to 108°, and death occurred sixteen hours later.

In the interval between the primary and secondary symptoms there was posterior cervical glandular enlargement, with some constitutional reaction.

Lesions.—Subcortical abscess cavity, which had been evacuated during life. No superficial laceration or haemorrhage.

Case XXXIII. *Symptoms.*—Unconsciousness, which continued till death; haemorrhage from left ear; dilatation of both pupils, and subsequent contraction of the right; muscular relaxation, followed by later rigidity; temperature on admission, 99.6°, afterward 99.6 to 100.4°; one hour post mortem, 101.2°. Death in twelve hours.

Lesions.—Deep laceration of posterior portion and inferior surface of left temporo-sphenoidal lobe, with consequent cortical haemorrhage over occipital lobe; excessive cerebral hyperaemia.

Case XXXIV. *Symptoms.*—Coma; stertor; loss of urinary control; haemorrhage from nose and later haematemesis; pulse, 96 and full; res-

piration, 18; temperature, 100°, rising gradually to 102.6° some time before death in fourteen hours after admission.

Lesions.—Small epidural haemorrhage at site of fracture; rupture of dura; corresponding laceration in anterior inferior parietal region; laceration of anterior half of right middle temporal convolution; small laceration in centre of left cerebellum filled with fluid blood; general hyperaemia, most marked on left side posteriorly.

Case XXXV. *Symptoms.*—Unconsciousness; contraction of both pupils; rigidity of both lower and of right upper extremities; pulse and respiration too rapid to be counted; temperature, 101°, and in articulo mortis, 100.4°. Death in two hours. Temperature two hours post mortem, 99°+.

Lesions.—Pial haemorrhage over left frontal and parietal lobes, superiorly and externally, and over region of right occipito-parietal junction; subcortical laceration of left corpus striatum at junction of middle and posterior thirds; excessive general hyperaemia.

Case XXXVI. *Symptoms.*—Coma; stertor; alcoholic condition; no superficial injury; muscular relaxation; face flushed; pupils slightly contracted; vomiting; temperature, 97,° continued to be subnormal; pulse, 60; respiration, 16; one general convulsion just before death, at the end of eight hours and a half.

Lesions.—Fracture through left occipital, parietal, and squamous portion of temporal bone to margin of petrous portion; laceration of inferior surface of right frontal lobe and both temporo-sphenoidal lobes; pial haemorrhage over whole right parietal region.

Case XXXVII. *Symptoms.*—Consciousness lost but regained before admission after suicidal pistol-shot wound of the head; total loss of vision; exophthalmia of both eyes; dilatation of both pupils, which were irresponsive to light; temperature, 100.2°; pulse, 60; respiration, 20. Ophthalmic examination by Dr. P. A. Callan on the second day disclosed only patches of retinal haemorrhage; mental condition unimpaired; sense of smell entirely lost. On the fourth day an unsuccessful attempt was made to extract the ball, and a drainage-tube was afterward carried from the foyer of entrance through both frontal lobes to a cranial opening made upon the opposite side; followed for five days by discharge of brain tissue, and then till death by pus in increasing quantity. Mental condition normal till the fifth day, sluggish till ninth day, and afterward marked by increasing delirium, which lapsed into a muttering stupour to the end of life on the thirteenth day. Temperature at time of operation, 99°; rose to 103.6 in ensuing twenty-four hours, and then varied from 102.4° to 104.5° on the last day, pulse and respiration nearly normal till just before death.

Lesions.—Ball penetrated external wall of the right orbit, just behind the external angular process; passed beneath optic nerve, comminuted inner wall of the orbit, crista galli, cribriform plate, and lesser wing of

the sphenoid; entered left orbit through inner wall, and was found beneath left optic nerve. In the cranial cavity its course was beneath both optic nerves. Subarachnoid purulent effusion covered both frontal lobes, more copious on the left side and at the base; left frontal lobe was excavated and filled with pus and brain detritus; pus also existed in the tract of the drainage-tube through the right frontal lobe.

I am indebted to a colleague for the opportunity of observing this case.

Case XXXVIII. *Symptoms.*—The patient, after having passed through three hospitals, with three discharges and two transfers, and after having wandered about the streets and suffered much exposure, was finally received and allowed to remain in an asylum for the insane, on the eighth day after a fall from the stoop of her house. She had then delusions and other symptoms of mental derangement, left facial paralysis, left subconjunctival haemorrhage, and haemorrhage from both ears. She died on the twenty-fourth day from the reception of the injury.

Lesions.—Transverse fracture of the base, extending through both petrous portions and left orbital plate; laceration of inferior surface of left frontal lobe; small subcortical laceration of left parietal lobe; cortical haemorrhage at base and over the external surface of both hemispheres; general contusion.

Case XXXIX. *Symptoms.*—Profound coma, which continued till death; stertor; pulse, 70, full and strong; temperature, 99.4°. Death in seven hours.

Lesions.—Linear fracture through right side of the occipital bone to jugular foramen; pial haemorrhage over both occipital and posterior portion of left parietal lobes; excessive general hyperaemia.

Case XL. *Symptoms.*—Contusion of left parietal region; primary unconsciousness; epistaxis; delirium, which continued till admission to hospital two days later; unconsciousness at that time; pupils normal; pulse rapid and weak; respiration, 21; temperature, 101.4°, rose to 102°+; consciousness not restored. Death in four days.

Lesions.—Linear fracture of occipital bone from tuber to right jugular foramen; also fissure of left orbital plate; thrombosis of lateral sinuses; clot firm, but not decolorized; general hyperaemia, with a few minute coagula.

Case XLI. *Symptoms.*—Unconsciousness succeeding an injury received on the preceding day; admission to hospital after twenty-four hours; right pupil slightly dilated; temperature, 99.8°; pulse, 96; respiration, 24; temperature rose to 100.2°. Death in about thirty hours from time of injury.

Lesions.—Linear fracture running nearly transversely through left parietal bone into right coronal suture; also V-shaped fracture from *contre-coup* in right middle fossa; epidural haemorrhage over right frontal lobe from vertex to base; laceration of middle two fourths of

second right temporal convolution, with cortical haemorrhage extending over parietal lobe; general hyperaemia with minute coagula in all parts of the brain.

Case XLII. *Symptoms.*—Shock; consciousness retained; temperature, 96°; pulse, 78; respiration, 21; sudden cyanosis, with extreme dyspnoea, and loss of consciousness which lasted for only three or four minutes, followed by numbness of both arms; no further dyspnoea; delirium fourteen hours later, and death four hours later still, preceded by a single convulsive movement and without respiratory disturbance.

Lesions.—Occipital contusion and wound behind right ear; bifurcated linear fracture in right inferior occipital fossa; pial haemorrhage beneath tentorium, extending around lateral borders of cerebellum and covering the pons. Moderate general hyperaemia.

Case XLIII. *Symptoms.*—Scalp wounds in left parietal and large haematoma in right parietal region; compound linear left parietal fracture; no known loss of consciousness; shock; dilatation of both pupils; pulse feeble; respiration shallow; temperature after four hours, 96.4°. Death in nine hours and a half.

Lesions.—Parietal fissure extended nearly across greater wing of sphenoid; considerable subarachnoid serous effusion; general hyperaemia and thrombosis of minute vessels, most marked posteriorly.

Case XLIV. *Symptoms.*—Unconsciousness till death; pupils normal; muscular twitchings over whole right side of the body; temperature on admission, 98°; in six hours, 103.6°; in seven hours, 104.4°; in nine hours, 106.6°; pulse, 80 to 145; respiration, 15 to 34. Death in nine hours and a half.

Lesions.—Calvarium crushed; large wound in the skull at the vertex involving the median line, two by three inches in its diameters; on the left side the osseous fragments rested upon the dura, on the right they deeply penetrated the brain; a fissure extended into the right orbital plate; epidural clot on the left side in which the parietal fragments were embedded; on the right side, disintegrated brain tissue, bone, and membranes were commingled; anterior part of both lateral ventricles contained blood; cortical haemorrhage extended beneath the tentorium; general hyperaemia and vessels even of larger size filled with thrombi.

Case XLV. *Symptoms.*—Scalp wound in left frontal region; left pupil dilated; consciousness only partially lost; temperature on admission, 98°; fell in four hours to 97.6°; pulse, 90; respiration, 24. Death in four hours and a half.

Lesions.—Slight depression at left external angular process of frontal bone and fissure, extending thence through both orbital plates and intervening ethmoid body; deep laceration of frontal lobes on either side of inferior median fissure; smaller laceration of posterior border of cerebellum, near median line, from which a cortical haemorrhage

extended over both its superior and inferior surfaces; general hyperaemia and minute coagula.

CASE XLVI. *Symptoms.*—Haematoma over whole vertex, and small wound of the scalp; unconsciousness which continued till death; dilatation of left pupil; general convulsions, beginning in the hands, with marked opisthotonos; temperature six hours after reception of injury, 98.6°; pulse, 84; respiration, 28; extent of fracture determined by incision. Death in nine hours.

Lesions.—Disjunction of coronal suture, multiple fissure of frontal bone, and fissure through right parietal and occipital bones, with branch into posterior fossa; laceration of right frontal, parietal, and occipital lobes, and wound of dura permitting escape of brain tissue through the osseous parietal opening.

CASE XLVII. *Symptoms.*—Contusions of left side of head and face and tactile evidence of simple fractures; unconsciousness which continued till death; epistaxis and haematemesis; temperature on admission, 99°; pulse, 96; two hours later—temperature, 96.4°; pulse, 140; respiration, 53; five hours later—temperature, 95.6°; pulse and respiration as before; second day, deglutition became possible and sensitiveness to external impressions was resumed; pupils slightly dilated; temperature, 103° to 103.6°; pulse, 168 to 196; respiration, 48 to 58. Death in thirty-four hours. (In this, the case of a child, four years and a half of age, the brain weighed forty-eight ounces, and was in all respects symmetrical; the skull wâs of normal thickness.)

Lesions.—Separation of the coronal and of the bifrontal suture to nasal bones, which were fractured; fracture continuous into ethmoid body, with complete detachment of the crista galli and cribriform plate; fissure of right parietal bone and depressed fracture of left frontal above orbital ridge; slight epidural haemorrhage over the vertex; laceration of frontal lobes in the space corresponding to the site of cribriform plate; general hyperaemia with minute coagular, most marked in cerebellum and occipital lobes.

CASE XLVIII. *Symptoms.*—None discovered, and admission to hospital refused two days after a fall in the street; found dead two hours later a block away; wound over left eye.

Lesions.—Pneumonia involving lower lobe of right lung, and large, flabby heart; fracture extending through left supra-orbital ridge and orbital plate into greater wing of sphenoid bone; general hyperaemia and thrombosis.

CASE XLIX. *Symptoms.*—Large haematoma over right eye; profuse haemorrhage from mouth, nose, and right ear; unconsciousness; rapid and feeble pulse and respiration; dilatation of both pupils, especially the left. Death in fifteen minutes. (Caesarean section at six months and a half; child lived forty-five minutes.)

Lesions.—Separation of right *sutura additamentum lambdoidalis* and fissure continued, through petrous portion and middle fossa, into body of sphenoid bone; large pial haemorrhage over left parieto-occipital region.

Case L. *Symptoms.*—Wounds over left eye and at the occiput; shock; unconsciousness; haemorrhage from ears, nose, and mouth; restlessness, and utterance of short, sharp cries; pulse frequent, weak, and symmetrical; respiration slow, irregular, and sighing; right pupil dilated, left invisible from ecchymosis; twitching of right side of face, followed by general convulsions, preceded death at end of twelve hours.

Lesions discovered by incisions: In left temporal region fissures ran into temporal fossa, and squamous suture was partially disrupted; in occipital region open fissure ran into right petrous portion and lambdoid suture was separated; arachnoid haemorrhage in right occipito-parietal region.

Case LI. *Symptoms.*—Scalp wounds in parietal regions; mobility and crepitation of calvarium; shock; unconsciousness which continued till death; slight epistaxis and profuse haematemesis; both pupils dilated, and after three hours and a half the right more so than the left; one radial pulse fuller and stronger than the other; temperature on admission, 101°; in one hour, 102°; in two hours, 106°; in four hours, 106.8°; pulse, 70, 110, 160, 170; respiration in two hours, 48. Death in four hours and a half.

Lesions.—Fissure, beginning just above left internal angular process, running across middle of parietal bones, and nearly circumscribing the calvarium; another detached its posterior portion, and others still extended from the primary line of fracture to the base; arachnoid haemorrhage on the left side; further examination refused.

Case LII. *Symptoms.*—Contusion in left frontal region and ecchymosis of left eye; consciousness retained; haemorrhage from right ear and from nose and mouth; delirium, becoming violent later in the day and during the night; on the second day, the patient formed a fixed delusion that he had fallen from a mulberry tree. He described with circumstantiality all the details of his imaginary accident. He had no recollection of the manner in which his injury had really occurred, and would give no credence to facts as they were presented to him; he had other and transitory delusions, but this one remained unalterable. Both pupils were moderately and symmetrically dilated. His mind became remarkably alert, and his conversation was logical and coherent. Nine days later haemorrhage from the right ear recurred, subconjunctival haemorrhage, which had been previously noted, increased, and the left eye became prominent. Mechanical restraint was still necessary to keep him in bed. On the twelfth day, haemorrhage from the ear ceased, and subconjunctival haemorrhage diminished; a scarcely perceptible facial paralysis existed. His mind seemed clearer; he could recollect the

street and neighborhood in which he lived, but not the number of his house; only the one delusion persisted. Later, a frontal headache from which he had constantly suffered became less urgent; but his general condition was not materially changed till two days before his death, when he became progressively asthenic from an intercurrent diarrhoea. His mind remained clear with occasional transient delusions, his conversation coherent, and his belief in the mulberry tree unshaken to the last.

Temperature on admission was 98.6°; one hour later, 100°; and five hours later, 104.7°; for the two days following it was 103° to 103.8°; and during the fourth and fifth days, 101° to 99°+; it varied till the twentieth day from 99.8° to 101.8°, only twice exceeding 100°. The pulse on admission was 85, and the respiration 20, with no considerable subsequent changes till near the close of life. Thirty-six hours ante mortem temperature rose to 102.4°, and twelve hours later to 105°; in another twelve hours it declined to 97.5°, and immediately before death rose again to 100°, with pulse 140, and respiration 42. Death on the twenty-fourth day.

Lesions.—Depressed fracture above left supraorbital ridge with fissure extending across both orbital plates and intervening cribriform plate, through right middle fossa, external to greater wing of sphenoid, through outer part of petrous portion of temporal into posterior fossa, and returning upon itself across the petrous portion and through the body of the sphenoid and ethmoid to finally terminate in itself anteriorly. A second fissure crossed the left orbital plate into the left middle fossa. Small epidural haemorrhage beneath the depressed part of the fracture; laceration of under surface of both frontal lobes, mainly subcortical, crossing median line obliquely from centre of left lobe to line of right anterior cerebral artery. This laceration was an inch and a quarter wide by an inch in depth at its commencement on the left side, and on the right side was five eighths of an inch in width by half an inch in depth. In removing the brain the arachnoid was torn and the diffluent contents of the cavity escaped; its margin and the overhanging cortical tissue were dark and sloughy; its deeper portion was yellow and ragged; it was separated anteriorly on the left side from the median fissure by a single convolution. There were general hyperaemia and minute thromboses, most marked posteriorly.

Case LIII. *Symptoms.*—Haematoma in left parietal region; coma; stertor; no response to external irritation; pupils widely dilated; pulse full, slow, and strong; temperature on admission, 99°, and rose steadily to 107.8°; respiration, 32, 46, 14; pulse, 62, 70, 126. Death in four hours and three quarters.

Lesions.—Coronal suture separated and fracture continued into anterior part of middle fossa on both sides; general hyperaemia with well-marked but not excessive oedema, and some punctate extravasations.

Case LIV. *Symptoms.*—Consciousness lost, but partially restored on arrival of ambulance; large haematoma in right posterior occipital

region; slight epistaxis; pupils moderately contracted; respiration shallow; right radial pulse after two hours more frequent than the left—84 and 74, 114 and 110; temperature on admission, 96°; in two hours, 95°; in six hours normal, and rose to 100.4° before death in nine hours.

Lesions.—Separation of coronal suture on the left side and fracture continued through middle fossa, sella turcica, right middle fossa, right petrous portion, and posterior fossa, to foramen magnum; large epidural clot in left temporal region; slight cerebral oedema; old meningeal adhesions, and small white nodules in the pia.

Case LV. *Symptoms.*—Consciousness retained for fifteen minutes after admission; then delirious four hours; afterward consciousness lost; contusion of right side of head; haemorrhage from left ear and nose, and haematemesis; slight dilation of right pupil; temperature on admission, 101°, and rose to 103°; pulse, 90 to 108; respiration, 22, 24. Death in ten hours.

Lesions.—Linear fracture extended from right squamous portion through body of sphenoid and both middle fossae into left temporal bone; a second fissure extended from sphenoid into cribriform plate; large epidural clot in left middle fossa; marked general hyperaemia.

Case LVI. *Symptoms.*—Delirium which continued till final unconsciousness at the close of life; wound in left temporal region; haemorrhage from right ear; second day, paralysis of left arm; fourth day, loss of control of urine and faeces; and death in three days and eight hours; temperature on admission, 99°+; rose to 103.2°, declined to 101°, and rose to 106.6° shortly before death; pulse, 90 to 114; respiration, 18 to 28.

Lesions.—Linear fracture extending from outer part of right petrous portion, through body of sphenoid bone into its left lesser wing; epidural haemorrhage in left middle fossa; large pial haemorrhage over right temporal and parietal lobes, especially profuse near the vertex; general hyperaemia with minute coagula; thrombus in each lateral sinus.

Case LVII. *Symptoms.*—Consciousness lost, partially recovered after admission; articulation imperfect; alcoholic condition; small wound in right occipital region; active delirium a few hours later; alternations of delirium and stupour till death, sixteen days afterward; temperature, pulse, and respiration normal from second to fourth day; temperature varied from 99.4° to 104.8° and was 103° at time of last observation; pulse, 112 to 144; respiration, 26 to 44.

Lesions.—Fracture extending from right of foramen magnum, three inches and a half, into the left inferior occipital fossa; laceration of inferior surface of both frontal and left temporo-sphenoidal lobes; pial haemorrhage over right occipital lobe; general subarachnoid serous effusion.

Case LVIII. *Symptoms.*—Coma which lasted for a few hours; wound in occipital region; no general symptoms noted till seventh day, when

sudden recurrence of coma and death; temperature second, third, and fourth days, 100.4° to 99.4°; after second coma, 104°; pulse and respiration normal.

Lesions.—Fracture through right middle fossa, involving petrous portion; laceration of inferior surface of right frontal and temporo-sphenoidal lobes; arachnoid haemorrhage over almost entire surface of right cerebrum; clot in the substance of the right centrum ovale.

Case LIX. *Symptoms.*—Momentary unconsciousness; contusion of left eye and wound of left frontal region; epistaxis without perceptible injury of the nose; second day, delirium at intervals, becoming constant through the night; third day, somnolence, restlessness, and delirium characterised by delusions; at close of the fourth day delirium became muttering and respiration stertorous. Death in four days and a half. Temperature on admission, 99.8°; on the second day, 104.8°, 102°, 100°, 103°, 101.8°; on the third day, 103.6°, 103.4°; on the fourth day, 103°+, 106.6°; on the fifth day, 107°, 108.2°. Pulse till end of fourth day, 82, 56, 90, 106; respiration, 19, 34, 24, 40.

Lesions.—Fracture beginning at left external angular process of frontal bone, comminuting orbital plate, extending into body of sphenoid, and, after bifurcation, terminating in the cribriform plate and in squamous portion of right temporal bone; two lacerations of inferior surface of left frontal lobe—one near its centre as large as a hickory nut, containing disintegrated clot and brain tissue, the other smaller and more superficial, enroaching upon the middle portion of the Sylvian fissure; two other slight lacerations existed upon the inner border of right occipital lobe; slight subarachnoid serous effusion upon upper surface of cerebellum; general hyperaemia with some minute coagula.

Case LX. *Symptoms.*—Consciousness not lost, but delirium continuous from time of injury till final coma; contusion behind left ear; very slight dilatation of pupils; delirium became violent; at the end of two or three hours the patient became aphasic; he could utter single words correctly, or a number of words in succession, each correct in itself, but strung together without sense or logical sequence, as "water—father—when," or "Jesus—now—who." He also connected fragments of words with each other, as "en—is—other," meaning when his mother; or "J—mother," for Jesus' mother; or "J—ter," for Jesus, water; sometimes "ter—J," for water, Jesus. The clew to these fragmentary words and sentences was found in the words he constantly used singly. The aberrations of speech, like the delirium, continued till final coma, and were constant. On the second day his head was extended, but without cervical rigidity; he was restless and irritable; the pupils were still normal; urine was retained; coma and stertor supervened, and death occurred thirty-seven hours and a half after admission. The temperature on admission was 100.2°, rose progressively in twenty hours to 105.2°, remained stationary for twelve hours, and again rose progressively to 108.6°. One hour post mortem it was 110°. The pulse constantly

increased in frequency from 90 to 190. The respiration did not exceed 24 for thirty-two hours, after which it was from 40 to 50.

Lesions.—Fracture extending from the left superior occipital fossa, through the posterior condyloid foramen, into the foramen magnum; epidural haemorrhage, slight over the occipital lobes and more abundant in the inferior occipital fossae; cortical haemorrhage in central part of anterior fossae and over sella turcica; thrombi in left lateral and superior petrosal sinuses; posterior meningeal veins, including those of larger size, greatly distended; some opacity of arachnoid, and subarachnoid serous effusion over right occipital lobe. Lacerations were confined to the base, except in case of left temporo-sphenoidal lobe. The first left temporal convolution was lacerated through the whole thickness of its cortex for a length of an inch and a half, which included the second and part of its third fifths, estimated from its anterior extremity and its middle portion involved the second convolution. This laceration was limited to the exact width of the two convolutions and was covered by the unruptured arachnoid. A small and deep laceration existed upon the inferior surface of this lobe, and another, small and shallower, was situated at its tip, involving all three of its convolutions. A similar slight laceration occurred at the anterior extremity of the right temporo-sphenoidal lobe, including the second and third convolutions. There was an extensive laceration of the under surface of the left frontal lobe, extending from its anterior border to the optic chiasm and from the median line outward through the first and second into the third orbital convolution; it disintegrated the cortex and the subcortex to a considerable depth, and the resultant haemorrhage had broken through into the arachnoid cavity. There was finally a small contusion about the centre of the inferior surface of the right frontal lobe. The brain substance was generally hyperaemic with minute thromboses, and a small amount of reddish serum occupied the lateral ventricles.

Case LXI. *Symptoms.*—No evidence of brain lesion on admission, twenty-four hours after injury, except right radial pulsation was fuller and stronger than the left; followed by delirium, with delusions, after sixteen hours, which, with the unsymmetrical pulse, persisted for five days. On the sixth day, mind clear, memory restored, general headache; later, delirium at intervals, aimless inclination to get out of bed, increasing difficulty of articulation, progressive mental impairment; control of bladder and rectum lost. On the twenty-fifth day, condition quiet, weaker, picking at the bedclothes. Twenty-sixth and twenty-seventh days, delirium, irritability, great sensitiveness to external disturbances, unconsciousness. Death occurred on the twenty-eighth day. Temperature on admission, 102°; second and third days, 103°, 104.4°; from this time it was usually 99° to 99° +, sometimes normal, occasionally 100°, until the last eighteen hours, when it suddenly rose to 105°, and, with slight recessions, finally reached 108°. Pulse, 84 to 54, till the last four days, when it exceeded 100; but in the last twelve hours, with the highest temperature, it ranged from 70 to 54. Respiration was

accelerated on the second and third days, but at other times was normal till within a few hours of death. Right axillary temperature the day before death was from 0.2° to 1.2° higher than the left. Temperature one hour post mortem, 108°.

Lesions.—Open fissure extended from beneath tocular Herophili, downward and slightly outward, to a point near the left margin of the foramen magnum, where it subdivided to enclose a quadrangular depression of bone three quarters of an inch by half an inch in its diameters; it was then continued between the posterior border of the petrous portion and the basilar process of the occipital bone, where it terminated. No external evidences of injury; small epidural haemorrhage on either side of median line at commencement of fracture; two thin laminar spots of epidural clot, each about half an inch in diameter, firmly attached to the dura over anterior part of the left frontal lobe, from *contre-coup;* corresponding blood stains upon the surface of the bone, but under surface of dura not discoloured; large subarachnoid serous effusion over the vertex; meningeal hyperaemia, but not of the cerebral surface. Four lacerations of the antero-superior surface of the left prefrontal lobe, with contusion of intermediate cortex, the whole covering a space an inch and a half in diameter; another laceration of small size a short distance behind them; small laceration upon the anterior part of the external surface of the right frontal lobe; these lacerations all extended into the subcortical substance and were partially filled with necrotic tissue; the adjacent brain substance was unaltered. Marked general oedema and hyperaemia, with moderate number of punctate extravasations and minute thrombi; brain of normal consistence.

Immediate microscopic examination afforded no evidence of inflammatory action, except in contiguity to the necrotic tissue. The quadrangular osseous depression was firmly fixed, but there was no osseous deposit.

Case LXII. *Symptoms.*—No history; walking case; semi-consciousness, but without speech or comprehension of speech then or afterward; haemorrhage from left ear, and oedema of the left mastoid region; pupils normal; early delirium; sensitiveness to external irritation; retention of urine. Second day, entire unconsciousness; convulsive movements of the limbs; Cheyne-Stokes respiration; accumulation of mucus in the trachea and bronchi, and death in forty-two hours. Temperature on admission, 101.6°; in twenty-four hours, 103.2°; in twenty-seven hours and till death, 108.6°; one hour post mortem, 108°. Pulse, 64 to 50; second day, 140 to 168. Respiration normal, 24, 16, 20.

Lesions.—Haematoma in left occipital region; linear fracture through left occipital bone, from median line and along the groove for the lateral sinus, across the petrous portion by a wide fissure, and separating the dorsum ephippii from the sphenoid bone; thrombus in left lateral sinus; complete disintegration of the right frontal lobe, to within half an inch of the fissure of Sylvius and quite to the anterior border of the corpus

striatum; deep laceration of greater part of the inferior surface of the left temporo-sphenoidal and a smaller laceration in the centre of the inferior surface of the right temporo-sphenoidal lobe; cortical haemorrhage from the frontal laceration filled all the basic fossae except the outer part of the left anterior, and one clot in the median line anteriorly was as large as a mandarin orange; it also was covered with a thin coagulum the superior and lateral surfaces of the whole right and greater part of the left hemispheres, and extended over the superior surface of the cerebellum; general hyperaemia, with a few minute coagula; minute extravasations in the centre of the pons, the largest of which was about the size of a robin shot.

Case LXIII. *Symptoms.*—Primary unconsciousness, followed by mental hebetude and mild delirium, which continued till death; occasional dysphagia in second week, sometimes extreme. Temperature on admission, 99.2°, rose in two hours to 102°, and was afterward 99° to 100° and 101°. Pulse on admission, 50; below 90 for eight days; afterward exceeded 100. Respiration normal. Death occurred in fourteen days, and was immediately preceded by extreme dyspnoea and dysphagia.

Lesions.—Fracture through left occipital, from median line to petrous portion of temporal bone; extensive laceration of antero-superior and inferior surfaces of left frontal lobe; cortical haemorrhage covered with a thin clot the entire left hemisphere and posterior half of the right, and filled all the basic fossae.

Case LXIV. *Symptoms.*—Contusion in occipital region, and recurrent haemorrhage from left ear; violent delirium after thirty-six hours; right radial pulse fuller and stronger than the left on the third and fourth days. Temperature on admission, 98.4°, rose in twelve hours to 102°, and afterward varied from 98.5° to 100°+ in the morning, and from 99.5° to 100.8° in the evening; last observation, six hours ante mortem, 101.6°. Pulse and respiration were practically normal. Death in ten days.

Lesions.—Fracture through posterior part of left parietal into petrous portion of temporal bone; transverse laceration across inferior surface of right frontal lobe at junction of its anterior and middle thirds; subcortical, except at outer extremity, where haemorrhage had broken through the surface; small laceration of anterior fourth of second right temporal convolution, mainly subcortical; cortical haemorrhage in right middle and posterior fossae, and to a small amount in right anterior fossa; moderate general hyperaemia, with a few minute coagula.

Case LXV. *Symptoms.*—Consciousness lost and partially restored; persistent occipital pain; admission to hospital four days later; stupour merging in final unconsciousness; loss of control of bladder and rectum; right radial pulse fuller and stronger than the left, but difference not strongly marked; pupils normal; temperature on admission, 100°; normal, with exception of eight hours on the seventh day, when it was

99.2° to 99.4°, till ten hours ante mortem; final temperature, 99.2° to 103.8°; pulse, 45 to 80; respiration, 14 to 18. Death in ten days.

Lesions.—Haematoma in left occipital region, mainly upon left side; biparietal and left parieto-occipital sutures loosened but not separated; small laceration on under surface of right frontal lobe anteriorly; cortical haemorrhage covered the whole lateral and superior surfaces of both hemispheres, except in left lower parietal region, extended into median fissure and beneath tentorium over superior surface of cerebellum, and occupied both anterior and both middle fossae. The effusion was thin, except at the base and over the frontal lobes, where the clot was thick, firm, black, and closely adherent to the cortex, and could be traced into the frontal laceration from which it originated. A still smaller laceration existed upon the inferior surface of the right temporo-sphenoidal lobe. The brain was moderately hyperaemic and very oedematous in its cerebral portion. There were no punctate extravasations, few minute coagula, and no inflammatory products.

Case LXVI. *Symptoms.*—Complete unconsciousness, which continued till death; haemorrhage from nose and mouth; pupils contracted and immovable, but in a few hours the left became dilated; some convulsive movements of the right arm; retention of urine; second day, ecchymosis of both eyes and sub-conjunctival haemorrhage in the right; continued dilatation of the left pupil; right normal; temperature on admission, 101°; in four hours, 102°; in sixteen hours, 105°, and in twenty-four hours, 106°; pulse and respiration frequent throughout. Death in twenty-six hours.

Lesions.—Extravasation of blood into the substance of left temporal muscle disclosed by incision; open fissure extended from squamous portion of right temporal bone across both orbital plates and intervening cribriform plate of the ethmoid, broke off left lesser wing of the sphenoid, crossed left middle fossa and petrous portion, and terminated in left margin of foramen magnum; epidural clot occupied the whole right anterior fossa, and another of smaller size existed in the left middle fossa; a thrombus filled the posterior part of the superior longitudinal sinus; cortical haemorrhage over superior surface of the cerebellum, derived from a small laceration of its lateral border; small pial haemorrhages over left parietal and temporo-sphenoidal lobes, and a larger one over right parietal lobe; large sub-cortical laceration of left temporo-sphenoidal lobe, excavating its substance beneath the second, third, and anterior portion of first convolutions, which did not reach the surface; moderate general hyperaemia more marked in the pons and cerebellum.

Case LXVII. *Symptoms.*—Patient walked two miles to the hospital gate and was carried unconscious to the ward; ecchymosis of right eye and wide dilatation of right pupil, slight contraction of the left; no motor or sensory disturbances; left brachial pulsation full and strong, the right very small and weak; same conditions existed in the radial arteries, but the contrast somewhat obscured by contusion of the left

wrist; temperature on admission, 98°; four hours later, 104.6°; immediately after death, 105°; half an hour post mortem, 105.4°; pulse, 40 to 64; respiration, 32 to 36; cyanotic just before death, at the end of five hours.

Lesions.—Contusion of scalp, disclosed by incision, extending from coronal suture backward above the temporal ridge; fracture in right middle fossa, involving both squamous portion of temporal and greater wing of the sphenoid bone; firm epidural clot from laceration of anterior branch of the arteria meningea media, measuring three fluid ounces, which filled the right middle fossa and flattened the temporal lobe laterally and inferiorly. When the clot was removed the brain retained its position, widely separated from the base, and leaving the anterior petrous surface and the adjacent middle fossa exposed. The smaller superficial veins and arterioles of the brain were congested, and the surface between them, at first pale, was soon uniformly reddened. There was a small laceration of the posterior part of the third left temporal convolution; another somewhat smaller than a buckshot was found in the anterior part of the pons at the apposition of the longitudinal fibers. The brain substance was generally hyperaemic, especially in the left hemisphere, but without minute extravasations or thrombi. The surfaces of section soon became deeply reddened and bathed in watery effusion.

Case LXVIII. *Symptoms.*—Partial unconsciousness; recurrent haemorrhage from right ear, succeeded by a flow of serous fluid; vomiting; dilatation of both pupils; retention of urine; greater fullness and strength of left radial pulse than of the right; mental condition normal; intercurrent bronchitis on the third day, which ran its usual course; from the second day a peculiar dusky and swollen appearance of the face, which continued till within two or three days of death; no other indications of cerebral injury till the fourteenth day, when there was occipital pain, which became general headache, and a little later somnolence and occasional irritability. On the eighteenth day, the fifth of this epoch, posterior cervical rigidity; delirium; temperature at its maximum; tenderness along the course of the larger nerves of the left lower extremity from the twentieth to the twenty-fifth days; delirium more active, lucid intervals less frequent, somnolence more continuous, and sense of hearing impaired; deafness progressive till complete power of articulation gradually lost, and finally communication only possible by gesture; dysphagia occurred more suddenly and a little later. The mental condition varied from normal to that of stupour or delirium; emaciation was progressive; paralysis and hyperaesthesia of the left lower extremity were of late occurrence; recurrence of posterior cervical rigidity was once noted, but was transitory; toward the end control of urine and faeces was lost; during the last twelve hours unconsciousness was complete, and respiration rapid, insufficient, and entirely nasal. Death occurred on the thirty-first day. The temperature on admission was 97°, became normal in four hours, and was afterward 99° till the

invasion of bronchitis, on the third day, when it rose to 103°, and subsided with recovery from the complication. On the tenth day it again rose with the recurrence of intracranial symptoms to 103.4°, and afterward varied from 100° to 104°, and was not often less than 101°+. The post-mortem temperature receded in half an hour from 103.4° to 103°. The axillary temperatures, carefully recorded from the sixth day, were symmetrical in nearly half the observations, and in others usually varied two tenths of a degree, and were rather more frequently higher on the right side. The pulse was usually from 64 to 90. The respiration, always frequent, was rarely less than 30 in the minute from the time of admission.

Lesions.—No external injury; linear fracture extending from squamous, through petrous portion of right temporal bone; simple thrombosis of lateral sinuses from torcular Herophili into jugular veins; punctate extravasations in pia mater; large occipital veins distended; no serous effusion at the vertex; but patches of false membrane mainly upon left frontal lobe, and upon either side of the median fissure. Several ounces of turbid serous effusion at the base, and a large amount in the lateral ventricles; fibrinous exudation covering the pons, medulla, and inferior surface of the cerebellum, one to two millimetres in thickness, and in the Sylvian fissures; limited contusion of posterior part of the surface of the right temporo-sphenoidal lobe, covering a space an inch square, which was of a yellowish colour and studded with hard miliary haemorrhages; fornix much softened, and brain substance generally hyperaemic and oedematous.

Immediate microscopic examination showed the membranous effusion to be crowded with small round cells, which extended for some distance in diminishing quantity into the substance of the underlying cerebellum. Other portions of the brain tissue were unchanged. The *Streptococcus pyogenes* was developed from cultures of the exudation.

Case LXIX. *Symptoms.*—Consciousness lost, but restored at time of admission; haematoma over right frontal region; vomiting; severe frontal headache; face flushed; pupils normal; temperature, 95°; pulse 90; respiration, 20. One hour later, wide dilatation of right pupil, and right cornea more sensitive than the left; sudden unconsciousness, followed by rigidity of the left side, and convulsive movements of the right. At the end of an hour and a half, temperature, 97°; pulse, 85, and Cheyne-Stokes respiration. Death in three hours from time of injury.

Lesions.—Linear fracture in squamous portion of right temporal, continued through anterior part of middle fossa, and terminated in the body of sphenoid bone; large epidural haemorrhage over lateral surface of the right hemisphere nearly to the median fissure; blood partially coagulated and derived from posterior division of the arteria meningea media; surface of the right temporal and anterior part of the right occipital lobe somewhat flattened; slight contusion of left second temporal convolution; brain moderately hyperaemic and oedematous.

CASE LXX. *Symptoms.*—Gunshot wound; immediate unconsciousness; rapid and feeble pulse; sighing respiration; profuse haemorrhage from wounds of entrance and exit. Death within an hour.

Lesions.—Gunshot fracture of right frontal bone through temporal fossa; ball grazed the outer and posterior part of the orbital plate and fractured the right lesser wing of the sphenoid, grooved the inferior surface of both frontal lobes just anterior to the fissures of Sylvius, destroying the cortex and subcortex for a space three fourths of an inch in width, and emerged through the left temporal fossa at a little higher level than the point of entrance. The vertex and base were fissured from the point of exit, and the coronal and biparietal sutures divulsed and widely separated. The whole surface of the brain was covered by a thin subarachnoid haemorrhage which was partly cortical and partly pial. The brain substance generally was markedly hyperaemic and its minute vessels filled with coagula. The corpora striata and optic thalami, especially the striata, were much contused, their substance studded with punctate extravasations, and their vessels distended with thrombi. The pons, medulla, and cerebellum were but slightly altered.

CASE LXXI. *Symptoms.*—Coma; stertor; pulse strong and irregular; respiration slow; slight dilatation of both pupils, which were insensitive; slight twitching of both arms; extremities cold; no external evidence of injury; temperature, 94.2° to 101.2°; respiration, 24, 20, 14; pulse, 42 to 52. Death in eleven hours.

Lesions.—Linear fracture extended from just above and behind right ear into the posterior inferior fossa; enormous epidural haemorrhage, derived from the posterior division of the middle meningeal artery, which compressed the right hemisphere; slight laceration of the right parietal lobe, posterior to the fissure of Rolando.

CASE LXXII. *Symptoms.*—Unconsciousness, which continued till death; contusions and superficial wounds of the left side of the face and temporal region; dilatation of both pupils, of the right more than of the left; haemorrhage from mouth, nose, and right ear; relaxed muscles and imperceptible pulse at the wrist. Death occurred five minutes after admission, and in about an hour after reception of injury.

Lesions.—Haematoma over left temporal, both parietal, and right occipital regions, from rupture of the intracranial vessels; calvarium crushed on the left side anteriorly, and its fragments deeply depressed and distorted; zygoma and both orbital plates comminuted; body of the sphenoid bone disintegrated, and the base of the skull extensively fissured; thin pial haemorrhage covered the entire brain, possibly augmented by some cortical effusion at the base; limited contusions confined to the cortex about the right parieto-frontal junction and along the right side of the median fissure; cortical lacerations upon the inferior surface of the left frontal lobe and at the tip of the left temporo-sphenoidal lobe; brain substance generally hyperaemic and oedematous, with a few punctate extravasations.

Case LXXIII. *Symptoms.*—Patient was found in the early morning, sitting in a chair, in which he was said to have passed the night. He would not reply to questions, from seeming lack of comprehension. He could walk, though he had little control over his limbs; his face was pale, and showed traces of vomiting. On admission there was partial consciousness, right hemiplegia and hemianaesthesia; dilatation of left pupil and contraction of the right; loss of control of urine and faeces; profuse serous discharge from both ears, and slight oedema of the lungs. Two hours later coma was complete and oedema of the lungs had increased. Death occurred in ten hours. Temperature on admission, 99.2°; in two hours, 101.2°; in four hours, 103°; in six hours, 103.4°; in nine hours, 103.8°; in ten hours, when *in articulo mortis*, 104°; thirty minutes post mortem, 106°. The right axillary temperature was 0.2° higher than the left at each observation. Pulse, 90 to 108; respiration, 36, 30, 38.

Lesions.—Slight haematoma over right parietal region disclosed by incision; fracture extending from right of occipital tuber, across petrous portion, into greater wing of sphenoid; opacity of arachnoid in right frontal and anterior parietal regions; small cortical haemorrhage over frontal lobes; extensive laceration of the frontal, temporal, and inferior portion of parietal lobes on the left side; these parts were excavated and filled with a dark solid clot which was extruded in large quantity through a long tear made in the process of removal of the brain from the cranial cavity; slight ante-mortem cortical rupture through which a little blood had escaped into the middle fossa and ascended upon the frontal region, and another into the posterior cornu of the lateral ventricle, through which the chorioid plexus was infiltrated; small, deep laceration upon the anterior border of the left cerebellum; moderate general hyperaemia and marked oedema, with a few punctate extravasations; thrombi in the superior longitudinal and lateral sinuses.

Case LXXIV. *Symptoms.*—Pistol-shot wound through right temporal fossa; cutaneous opening small and circular; consciousness permanently lost; pupils dilated, the right slightly the larger; left corneal reflex absent; urine retained; some pulmonary oedema; temperature on admission, 96.4°, and from 96.8° to 96° for five hours, then declined to 95.6°; pulse on admission, 85, subsequently from 94 to 80; respiration on admission, 14, for an hour and a half, 12, in two hours and a half 10, in three hours 8, in four hours and a half 6, in five hours 4, and *in articulo mortis*, a few moments later, 2. Cardiac action continued three minutes after respiration ceased.

Lesions.—Ball entered the cranial cavity, severing the trunk of the middle meningeal artery, passed through the third right temporal convolution, and was lodged in the posterior part of the inner border of the right temporo-sphenoidal lobe. A small piece of bone, driven in advance of the ball, was found between the right lateral columns of the medulla. A large arachnoid clot, probably in part epidural and in

part cortical, filled the middle fossa, spread over the whole right hemisphere, and thickly covered the pons and medulla. Hyperaemia of the right hemisphere and basic ganglia was of considerable intensity.

Case LXXV. *Symptoms.*—Fell down a flight of stairs; still unconscious on admission; wound in left occipito-parietal region; haemorrhage from left ear; right pupil irresponsive and widely dilated, left pupil moderately dilated, muscular system relaxed; temperature on admission 95° and in an hour normal; rose progressively to 104.2°; right axillary temperature uniformly from 0.2° to 0.4° higher than the left till the last observation, when the difference was 2°; respiration 22 to 24; pulse on admission 72, irregular and intermittent, and afterward 78 to 86 till immediately before death, which occurred in eight hours and a half.

Lesions.—Fracture which extended from the left inferior occipital curved line through petrous portion into sella turciça; laceration, two inches long by an inch wide, of the inferior surface of the left temporosphenoidal lobe; another, half an inch in diameter, at the anterior extremity of the first left temporal convolution; and a third upon the inferior surface of the right frontal lobe, which involved its anterior half; cortical haemorrhage filled right anterior and both middle fossae, covered the right hemisphere laterally, and extended as a thick clot over the right frontal lobe and along the corpus callosum quite to the cerebellum; some small extravasations in the substance of the pons; general hyperaemia and punctate extravasations in the anterior and posterior portions of the brain.

Case LXXVI. *Symptoms.*—Coma; stertor; left pupil dilated; small wound and larger haematoma in left parietal region; sensation diminished in both lower extremities and muscular twitching in the right; vomiting; pulse 52. After trephination a soft epidural clot was discovered and a considerable loss of blood ensued. Using as a guide a fissure which extended through the squamous and petrous portions into the middle fossa, the bone was chiseled and the posterior division of the middle meningeal artery, which was found to be the source of haemorrhage, was clamped. The pulse increased in frequency to 72 to 104, the pupils became normal, but consciousness was not restored, and death occurred a few hours later.

Lesions as above.

Case LXXVII. *Symptoms.*—Unconsciousness and death immediately after admission.

Lesions.—Skull crushed and flattened on right side; fragments very movable; comminuted on the left side; extensive laceration of the brain posteriorly in the left hemisphere; only small superficial wounds of the scalp.

Case LXXVIII. *Symptoms.*—Coma; stertor; haemorrhage from left ear; contusions of left parietal region; pupils dilated; pulse full and

slow; temperature on admission 98°, and rose progressively to 103.6° at time of death in four hours; no decrease for an hour post mortem; respiration 18 to 26; pulse on admission 70 and rose to 90.

Lesions.—Fissure extended from left parietal eminence, through squamous and petrous portions into middle fossa; deep laceration of inferior surface of right temporo-sphenoidal lobe and of lateral border of right cerebellum; cortical haemorrhage filled right middle fossa; hyperaemia of the right side of brain.

Case LXXIX. *Symptoms.*—Consciousness lost and not regained; coma grew more profound; slight oedema of scalp in right temporal region; pupils slightly dilated; great restlessness and irritability; lack of urimary control; temperature on admission 100.4° and rose to 108°, with only two or three brief fractional recessions; pulse, 94, 58, 80; respiration, 28 to 24. Death in forty-three hours.

Lesions.—Haematoma over whole right side of the head; linear fracture from right frontal through parietal bone into the inferior occipital fossa; large epidural clot over the whole base on the right side, extending upward over the lateral surface of the brain; laceration of the inferior surface of both temporo-sphenoidal and both occipital lobes; laceration of the inferior surface of both frontal lobes in their anterior portion, very extensive on the left side; cortical haemorrhage over posterior border of the cerebellum; extensive general hyperaemia with punctate extravasations.

Case LXXX. *Symptoms.*—None; patient found dead.

Lesions.—Large lacerated pistol-shot wound in right temporal region; temporal muscles burned and disintegrated for some distance from the cutaneous opening. The ball passed through both frontal lobes, comminuted both orbital and intervening cribriform plates, and emerged through left temporal fossa. The calvarium was separated from the supraorbital ridges and broken into the large loose fragments in its anterior portion.

Case LXXXI. *Symptoms.*—Large haematoma over left frontal region; epistaxis and haematemesis; simple fissure from left frontal eminence into the orbital plate disclosed by incision. On the sixth day, muscular twitching of the whole right side, including the extremities, but not the face, which ceased entirely in fourteen hours and was followed by left hemiplegia and hemianaesthesia. On the seventh day a convulsion, confined for thirty minutes to the right side and which afterward became general, occurred two hours before death. Temperature on admission was 100.2°, rose to 104.4° on the same day, and to 105.6° on the next, with recessions, and afterward varied from 102° to 105.2°, with no observation for six hours ante mortem. Pulse on admission was 120, and subsequently 130 to 150. Respiration 26 on admission, and later 44 to 58.

Lesions.—Fracture extended from the orbit through posterior part of the ethmoid and body and right lesser wing of the sphenoid into the

floor of the right middle fossa; general subarachnoid purulent effusion most marked in the left frontal region below the site of fracture.

CASE LXXXII. *Symptoms.*—Conscious on admission; Cheyne-Stokes respiration; dilatation of left pupil; right radial pulse fuller and stronger than the left; haematoma on the right side of the head anterior to the occipital junction, and small lacerated wounds over both frontal eminences; muscular contractions of left side, and later of both sides of the body. On admission, temperature, 99.3°; pulse, 104, and respiration, 19.

Lesions.—Multiple fracture; fissure across frontal bone above the orbits, extending on either side through the parietal bone to the median line of the vertex on both sides, thence to the occiput, and on the right side behind the ear to within an inch of the foramen magnum; another fissure on the left side extended through the orbital plate of the frontal and lesser wing of the sphenoid into the middle fossa. The dura and pia were lacerated from right mastoid region to a point just beyond the median line. The right motor area was extensively lacerated, and the right optic thalamus and corpus striatum to a lesser extent. The left hemisphere was uninjured.

CASE LXXXIII. *Symptoms.*—Suicidal gun-shot wound; ball entered just below right ear and in front of the mastoid process, and was lodged in the petrous portion of the temporal bone; removed on the following day; delirium and rise of temperature on the sixth day, flexion of the right leg on the thigh on the eighth day, and death on the fourteenth day.

Lesions.—Fracture of anterior surface of the right petrous portion, epidural and arachnoid haemorrhage at that point, pial haemorrhage over left occipital lobe and left motor area, and laceration of the temporo-sphenoidal lobe at the site of fracture.

CASE LXXXIV. *Symptoms.*—Suicidal wound through the anterior cervical region; ball of 0.38 calibre entered in median line over the larynx; no haemorrhage from the wound or mouth; immediate partial aphonia; deglutition of liquids only possible and with difficulty; haemorrhage from left ear. On the third day, deglutition impossible and mental condition stupid; followed by delirium requiring mechanical restraint on the fourth day, and on the fifth day, by paresis of right arm, hand, and lower extremity, and loss of faecal and urinary control, with some improvement in voice and power of deglutition. On the sixth day there was added right facial paralysis with ptosis; the right pupil was dilated and the left contracted, and the urine was controlled. The temperature on admission was 100°, rose on the second day to 101°, on the third day to 102.4°, and on the fourth day to 103.6°; later it attained an elevation of 107.6°. The pulse was from 70 to 86 till the fourth day, when it rose to 132. The respiration was normal for four days and

became frequent only at a late period. Death occurred on the seventeenth day.

Lesions.—Bullet was lodged in the apex of the left petrous portion; small fragment of bone driven upward about an eighth of an inch; no lacerations; large pial haemorrhage, in greatest amount over left fissure of Rolando; large subarachnoid serous effusion.

Case LXXXV. *Symptoms.*—Primary and permanent unconsciousness; wound above right superciliary ridge; ecchymosis of both eyes; stertor; haemorrhage from mouth, nose, and both ears; left pupil dilated, the right contracted, and both insensitive, and fibrillar twitching of the right chest muscles. No paralysis or muscular rigidity. The temperature on admission was 99.4°; pulse, 120, full and strong, and the respiration, 13; the temperature rose to 99.6°, and the respiration was reduced to 4. Death occurred in twenty minutes; immediate post-mortem decline in temperature.

Lesions.—Extensive comminuted fracture of frontal bone and both frontal plates extending through the middle fossae into the petrous portions; the left optic nerve was crushed by a fragment of bone in the optic foramen. The inferior surface of both frontal lobes was deeply lacerated over its whole extent, and a cortical haemorrhage, still fluid, occupied all the basic fossae, and covered the pons and medulla.

Case LXXXVI. *Symptoms.*—Primary and permanent complete unconsciousness; haemorrhage from left nostril; dilatation of both pupils; no convulsions or muscular rigidity; respiration not more than four to five in the minute at any time after the receipt of injury and finally not more than one; pulse continued full, strong, and of normal frequency for some moments after respiration ceased. Death in forty-five minutes.

Lesions.—Fracture extending through left side of the base into middle fossa; moderate pial haemorrhage covering whole surface of the brain, vertex, and base, and also the medulla; marked general hyperaemia and oedema; contusion of under surface of left temporo-sphenoidal and frontal lobes.

Case LXXXVII. *Symptoms.*—Primary and permanent unconsciousness; stertor; dilatation of the pupils; loss of urinary and faecal control and pulmonary oedema; left radial pulsation fuller and stronger than the right; no external injury. Temperature, 104° to 104.8°; pulse, 120 to 166; respiration, 24 to 52. Death in four hours and a half.

Lesions.—Fracture extending into both occipital fossae, and a fissure from *contre-coup* in the right middle fossa; large epidural haemorrhage from *contre-coup* over right frontal region; complete excavation of right frontal lobe with rupture of inferior cortex and consequent cortical haemorrhage over superior surface of whole right hemisphere and left frontal lobe; contusion of third left temporo-sphenoidal convolution and small extravasation into centre of the pons; general hyperaemia.

Fractures Confined to the Vertex.

Case LXXXVIII. *Symptoms.*—Delirium on the second and a convulsion on the fifteenth day after the original injury alone noted, and significance not recognised. Late symptoms followed an operation for fractured patella, with use of anaesthetic, six months afterward; general convulsions on the succeeding day, with wild delirium, and temperature 103°; the temperature and general condition became normal after twenty-four hours. One month later general convulsions recurred after another operative interference, and continued thirty-six hours, preceded by tonic spasm of affected (left) limb, and succeeded by delirium and death at the end of nine hours. Each convulsion was preceded by restlessness and wide dilatation of both pupils, and in about fifteen seconds began in the left face, extended to right face, to left extremities, and finally became general. Temperature from 100.1° rose in twenty-four hours to 104.8°, and afterward declined to 104°.

Lesions.—Extensive laceration of the right temporo-sphenoidal lobe, three inches and a half by an inch and a half in its diameters, involving almost the whole of the second and third, and a little of the first, convolutions; the whole lobe was greatly atrophied, indurated, and pigmented. Circular laceration upon the anterior border of the right frontal, and another, an inch and a half in diameter, upon the inferior surface of the left frontal lobe, in the second and third orbital convolutions. These lacerations were all necrotic.

Case LXXXIX. *Symptoms.*—Haematoma of left parietal region; unconsciousness, which was permanent; right facial paralysis, and rigidity of both arms and right leg; and twenty-four hours later, paralysis and rigidity of right arm; paralysis of right leg probable. Temperature on admission, 102.6°; pulse, 96; respiration, 36; later temperature, 105°. Death in thirty hours.

Lesions.—Epidural haemorrhage compressing laterally the whole left cerebrum; general hyperaemia and punctate extravasations.

Case XC. *Symptoms.*—Consciousness partly lost and soon regained; vomiting frequent; later, somnolence and coma. Temperature on admission, 100.2°; pulse, 48; temperature rose to 105.4°, Death in twenty-seven hours.

Lesions.—Compound common fracture of right frontal bone; corresponding laceration of right frontal lobe, through subcortex nearly to lateral ventricle, with cortical haemorrhage extending over parietal region; slight pial haemorrhage over left occipital lobe; minute vessels filled with coagula in all parts of the brain.

Case XCI. *Symptoms.*—Coma; stertor; pulse and respiration slow; second day, right hemiplegia; eyes deviating to the right; pupils normal; pulse feeble and rapid; respiration inadequate from pulmonary oedema. First temperature, some hours after admission, 101.6°; second day, 103.8° to 105.4°; third day, 106.4°. Death in sixty hours.

Lesions.—Laceration of left temporo-sphenoidal lobe extending into occipital region, with cortical haemorrhage over left motor area, and to base of occipital lobe; general hyperaemia and thrombosis.

CASE XCII. *Symptoms.*—Unconsciousness and irritability, which continued one week. Temperature, 99° to 100°; second and third weeks, delirium and continued irritability; fourth week, apathy, rambling speech and delusions, after which patient transferred to another hospital, where he died after operation.

Lesions.—Fracture in left occipito-parietal region; laceration of inferior surface of both frontal lobes.

CASE XCIII. *Symptoms.*—Coma; stertor; rapid pulse. Temperature fell to 95°. Death in four hours.

Lesions.—Gunshot fracture of right frontal bone; ball entered anterior extremity of fissure of Sylvius, traversed right frontal lobe just below the cortex, parallel to its curve and a little backward, crossed median fissure into left parietal lobe, impinged upon the left parietal bone, which it fractured, and fell back into its track half an inch below the surface, where it rested; little intracranial haemorrhage.

CASE XCIV. *Symptoms.*—Coma, soon becoming profound; normal pupils; general muscular twitching. Death in twelve hours.

Lesions.—Gunshot fracture of right frontal bone; ball traversed right hemisphere nearly in its antero-posterior diameter, just above corpus callosum, impinged upon inner surface of occipital bone, and fell into inferior occipital fossa above the dura; considerable cortical haemorrhage.

CASE XCV. *Symptoms.*—Gunshot wound of right temporal region; unconsciousness; no other immediate general symptoms; pulse, 70; temperature, 99°; consciousness soon restored; mental processes normal but sluggish; some discharge of brain matter followed an unsuccessful attempt to locate and remove the ball on the second day; wound afterward practically healed; mental condition apathetic, rational, but without any manifestation of interest in surrounding persons, things, or circumstances; urine and faeces voided without any indication of consciousness. Temperature, 100°+ to 103.6°, usually 101°+. Death in thirty days.

Lesions.—Gunshot fracture of right frontal bone; ball entered middle of right third frontal convolution, passed through central portion of both frontal lobes to a point just behind ascending arm of fissure of Sylvius in upper portion of island of Reil, and rested in a cavity five eighths by seven eighths inch in its diameter, surrounded by clot and brain detritus.

CASE XCVI. *Symptoms.*—Shock; consciousness retained; restlessness and delirium; temperature, 100.2°; rose to 104.6°. Death on the third day.

Lesions.—Compound fracture of left frontal bone, with corresponding laceration of brain and meninges; general hyperaemia and thrombosis.

Case XCVII. *Symptoms.*—Unconsciousness; dilatation of pupils; rapid pulse and respiration; temperature, 100°. Death in four hours.

Lesions.—Deep laceration of inferior surface of right temporo-sphenoidal and slight laceration of anterior border of left temporo-sphenoidal lobe; pial haemorrhage over superior surface of both hemispheres.

Case XCVIII. *Symptoms.*—Unconsciousness, followed by delirium soon after admission; extensive wounds of the scalp; normal pupils, right becoming dilated a little later; temperature, 98.2°; in two hours, 99°; pulse, 76; respiration, 22; delirium increased; pulse and respiration unchanged. Death in four hours.

Lesions.—Compound double camerated fracture involving right parietal eminence; skull very thick and unsymmetrical; posterior fossae large, middle and anterior fossae contracted; extensive pial haemorrhage, confined to meshes of pia, forming a thin sheet which covered superior and outer surface of right hemisphere and inferior surface of both occipital lobes; very marked general hyperaemia; especially on right side and in pons medulla; some minute haemorrhages upon posterior border of right cerebellum and upon the medulla.

Case XCIX. *Symptoms.*—Temporary unconsciousness; no other primary general symptoms; temperature on admission, 98.4°; second day, 101.6°; afterward, 99°+. On the tenth day, restlessness and slight delirium; eleventh day, slight chill and increased delirium, which became permanent, but of less active character; fourteenth day, post-cervical rigidity; and on the fifteenth, slight general convulsion; mental condition sluggish; pupils remained normal; respiration, 18 to 22; pulse, 104 to 112. Temperature on the evening of the tenth day rose to 101°, and on the eleventh day to 104.6°; it varied from that point to 103° till the fifteenth day, when it rose progressively and reached 107.4° on the sixteenth day, and death ensued.

Lesions.—Compound fracture with slight depression above right supra-orbital ridge, confined to external table; subarachnoid purulent effusion over both frontal lobes, encroaching upon parietal and extending into median fissure.

Case C. *Symptoms.*—Gunshot wound of right side of the head. Left facial paralysis on second day; hernia cerebri on the third day; mental condition deteriorated and paralysis increased. Patient transferred to Bellevue on the thirtieth day; then suffering from hysteria and melancholia, which had preceded the infliction of the injury; restlessness; loss of control of urine and faeces; left hemiplegia; slight dilatation of pupils; articulation difficult; sensation normal; pain in right supra-orbital region and at seat of the wound; mental processes slow. Temperature, 100°; pulse, 120 to 140; respiration, 20. At site of injury

there was an infected granulating wound, through which a probe could be passed into the brain. Four days later, under ether, an attempt was made to locate the ball, and a cavity was found to exist, extending nearly transversely inward two inches and a half, with moderately firm and well-defined wall, and having a small bit of bone at the bottom. The ball was not discovered. Temperature from admission had risen to 102.6° at time of exploration. Death occurred two days later; temperature then, 107.4°.

Lesions.—Gunshot fracture of right temporal bone in squamous portion; osseous wound had been enlarged by trephination; slight haemorrhage over right occipital lobe and a few threads of yellow exudate in same region and on the right side of the median fissure; ball passed through lower face area, nearly transversely inward to a point beneath the median surface and just above the calloso-marginal fissure; was then deflected backward at a right angle by the resistance of the falx cerebri, and was lodged an inch behind the cavity recognized at the time of exploration. General hyperaemia.

Case CI. *Symptoms.*—Gunshot wound of left side of the head. Unconsciousness, which continued till death, five hours later; slight dilatation of left pupil. Temperature one hour after reception of injury, 98.2°; two hours afterward, 97.6°; fifteen minutes before death, 99°. Pulse, 118 to 132; respiration, 28; later, 32 and stertorous; fifteen minutes before death, 7; and finally, 2.

Lesions.—Gunshot fracture of squamous portion of left temporal bone in its posterior portion, an inch below temporal ridge; foyer of entrance triangular; each arm half an inch in length; bone comminuted, and the fragments penetrated the cerebral cortex. Ball entered temporal lobe between two large branches of the meningeal artery, passed transversely across the brain immediately below the cortex, and was lodged in the right parietal lobe; cortical haemorrhage from injury of the right parietal lobe by the ball in its course, extended under the tentorium and over the pons and medulla, and was apparently the immediate cause of death; cerebral hyperaemia confined to the vicinage of the bullet track.

Case CII. *Symptoms.*—Unconsciousness, which continued till death at end of three hours; general muscular rigidity. Temperature, 101°; pulse, 98; respiration, 20.

Lesions.—Penetrating wound and fracture of left temporal bone, above the ear, three eighths of an inch diameter, from a blow inflicted with a revolving screw-driver. The instrument passed through both hemispheres, wounding the dura upon the opposite side, and involving the posterior part of the left corpus striatum and both optic thalami; a thin cortical haemorrhage covered both hemispheres and the superior surface of the cerebellum.

Case CIII. *Symptoms.*—Patient, nine days previous to admission, came home with head bleeding, vertigo, nausea, and feeling of weak-

ness, from an injury of unknown origin, and was said to have been afterward treated for pneumonia. On admission, he was found to have compound depressed fracture of right parietal bone, and the wound was foul and suppurating; mental condition stupid; left hemiplegia and right facial paralysis; deviation of tongue to the left; opposite radial pulsations symmetrical; slight dilatation of left pupil; coma supervened an hour later, and convulsive movements of the right face four hours and a half after admission. After elevation of the depressed bone, and escape of a small amount of pus from below the dura, the pupils became normal, and there was a single clonic convulsion of the left side. Death occurred thirteen hours and a half from time of admission. Temperature for twelve hours was 106°+, and afterwards 107.2°; one hour post mortem, 107.4°. Pulse, 118, 170, 158; respiration, 44 to 60.

Lesions.—Compound depressed fracture of right parietal bone, just behind coronal suture, and half an inch from median line; purulent subarachnoid effusion over convex surface of right hemisphere, which anteriorly extended to the base; superficial laceration of right parietal lobe beneath the site of fracture, which was prolonged subcortically, both anteriorly and posteriorly, but did not reach the motor area; pus from this laceration had escaped in small quantity into the arachnoid cavity; left hemisphere markedly hyperaemic and moderately oedematous.

Case CIV. *Symptoms.*—Consciousness previously retained; thirty minutes later general convulsions followed by complete unconsciousness and an apparently moribund condition. Elevation of a depressed portion of the left parietal bone restored consciousness and some strength to the circulation. Convulsions recurred next day, and death ensued in twenty-three hours. Temperature, 102.4° to 104.4°; pulse, 108 to 160; respiration, 32 to 60.

Lesions.—Fracture confined to the vertex; epidural haemorrhage of small extent, and laceration of inferior surface of right frontal and temporo-sphenoidal lobes. (Infant, aged 22 months.)

Encephalic Injuries without Fracture.

Case CV. *Symptoms.*—Violent delirium for two days; recurred on the sixth day, followed by unconsciousness and hyperaesthesia. Temperature, 103° to 104°; afterward, 100° to 103°; final temperature, 103°. Death in twelve days.

Lesions.—Pial haemorrhage over left occipital lobe, extending into median fissure; subarachnoid serous effusion.

Case CVI. *Symptoms.*—None recognized till fourth day, when there were four unilateral convulsions. A single one occurred on the fifth day, and then they continued with increasing frequency till death on the eighth day. Each one began by a twitching of the facial muscles, with head and eyes turned to the left, and extended to the left arm, and finally to the left hand. Temperature on admission, 100°; twelve hours

later, 103°; then 103° to 104°, till sixteen hours before death, when it rose to 105°.

Lesions.—Extensive laceration of right temporo-sphenoidal lobe, with cortical haemorrhage over whole right hemisphere.

CASE CVII. *Symptoms.*—Mental condition clear, but dazed, on admission ten hours after reception of the injury; extreme muscular tremour, followed in two hours by a general convulsion; from this time periods of general convulsions, with intervals of unconsciousness or delirium, lasting about six hours, alternated with periods of quiescence of equal length; no initial symptom. Death in two days.

Lesions.—Deep laceration of right frontal lobe, anteriorly and externally, extending into parietal region; cortical haemorrhage, covering right frontal lobe, right parietal lobe anterior to the Rolandic fissure, and the temporo-sphenoidal lobe, both laterally and inferiorly.

CASE CVIII. *Symptoms.*—None. Found dead in an upright position, leaning against a fence.

Lesions.—Lacerations and contusions covering greater part of left frontal and temporo-sphenoidal lobes; cortical haemorrhage over the whole left hemisphere.

CASE CIX. *Symptoms.*—Coma; stertor; contraction of pupils; full pulse; rapid respiration. Temperature, 101°+. On the third day coma more profound; dysphagia; continued irritability and restlessness. Temperature, 104.5°. Death in four days; temperature, 107.4°.

Lesions.—Small laceration at left parieto-occipital junction; cortical haemorrhage over posterior part of left parietal lobe; general hyperaemia.

CASE CX. *Symptoms.*—Coma, restlessness, and general hyperaemia; temperature, 103.4°; pneumonia discovered on the second day. Death on the third day.

Lesions.—General hyperaemia, with some punctate extravasations; organised membranous effusion, studded with calcareous nodules, over left hemisphere.

CASE CXI. *Symptoms.*—Sudden coma; stertor; double facial paralysis; complete right hemiplegia and hemianaesthesia; temperature, 99° to 103°. Trephination and drainage of serous effusion from the base by position of the head was followed within six hours by return of consciousness, mental clearness, power of articulation, and decline of temperature to 98.6°, and this improvement in condition continued fourteen hours; slight chill then preceded a progressive rise of temperature to 104.6°, and death occurred ten hours later.

Lesions.—Interior of left occipital lobe disintegrated by apoplectic clot, which extended into both lateral ventricles; consequent fall from

a cab caused a laceration of external border of right cerebellum and cortical haemorrhage, which spread over the pons into the transverse fissure.

Case CXII. *Symptoms.*—No primary general symptoms; temperature, 100°. Second day, delirium. Fourth and fifth days, headache. Sixth day, restlessness, irritability, and failing strength; mind clear. Eighth day, general muscular rigidity most marked in right side and arm, and, a few hours previous to death, perforating ulcer of the cornea. Temperature, second day, 103.2°; third day, 101° to 100.8°; fourth and fifth days, 103.4° to 103°; sixth day, 106.4°; seventh and eighth days, 105° to 105.2°.

Lesions.—General hyperaemia; minute thromboses and moderate oedema, markedly involving basic ganglia and cerebellum, and most pronounced on the left side; thrombi filled both lateral and both inferior petrosal sinuses, and extended into right jugular vein, and were decolorized only near the torcular Herophili.

Case CXIII. *Symptoms.*—Delirium; normal pupils and respiration; temperature, 101.4°; pulse, 114. Later, great hypersensitiveness and irritability. The delirium continued, though it did not prevent rational reply to questions; temperature rose to 103.2° on the fifth day, and afterward fell very gradually to 100°; on the fourteenth day it was 103.4°; and on the fifteenth, five hours ante mortem, it was 103.8°, and one hour post mortem it was 104.2°.

Lesions.—Cortical haemorrhage over both hemispheres and in largest quantity over parieto-occipital junctions; some subarachnoid serous effusion in left frontal region; general hyperaemia with punctate haemorrhages, most marked on the left side.

Case CXIV. *Symptoms.*—Primary unconsciousness; on admission, forty-eight hours later, muttering stupour; rigidity of left arm; incomplete right hemiplegia, more marked in upper extremity; pulse, 60; temperature, 101°; third day, increased rigidity of left arm; complete hemiplegia; profound coma; pulse, 128; temperature, 105°. Trephination was followed by increased freedom of movement and by some power of articulation. Death on the fourth day.

Lesions.—Moderate subarachnoid serous effusion over anterior two thirds of right hemisphere; laceration of left temporo-sphenoidal lobe, excavating and destroying its whole structure; cortical haemorrhage extending around the circle of Willis and upward upon the occipital lobe, and in patches upon the frontal and parietal lobes.

Case CXV. *Symptoms.*—No external evidence of injury; coma; stertor; rigidity of right side; pulse, 120; temperature, 100°. Death on third day; temperature, 103.2°.

Lesions.—Large subarachnoid serous effusions; recent clot in substance

of left cerebellum. An old laceration existed upon antero-superior surface of left occipital lobe, and another upon its inferior surface.

CASE CXVI. *Symptoms.*—Consciousness lost and partially restored before admission, twenty-four hours later; mental condition rational, but comprehension slow; slight dilatation of left pupil. Temperature, 99°, followed by some left paresis, and by some dysphagia referred to the left side of the throat. The patient, from the time of injury often fell out of bed, always on the right side. Subsequently transient facial paralysis occurred; amount of paresis and of dilatation of left pupil varied from day to day; mental condition deteriorated. Temperature for ten days was 99°+; later, 100°+ to 101°; pulse and respiration nearly normal. Trephination on the fifteenth day discovered a small subcortical cavity in the right leg area containing less than a drachm of yellowish fluid, afterward found to contain leucocytes. The temperature was 99°+ till eleventh day after operation, when it rose to 104°; next day, 101° to 104°. Death from asthenia on the twenty-eighth day after admission.

Lesions.—Large subarachnoid serous effusion compressing frontal lobes; general hyperaemia with minute coagula. The brain substance around the small subcortical cavity opened during life was softened and contained punctate extravasations.

CASE CXVII. *Symptoms.*—Unconsciousness, which still continued upon admission upon the second day; slight dilatation of the pupils; complete left hemiplegia and hemianaesthesia; slight left facial paralysis. Temperature, 106°; pulse, 140; respiration, 30; general convulsions beginning soon after admission, and frequently repeated; initial symptom in mouth and lower face. Trephination same day by house surgeon with negative result. Temperature two hours later, 107.4°. Death in a convulsion five hours after operation. Temperature, forty-five minutes post mortem, 109.4°.

Lesions.—General hyperaemia of the brain and membranes; tumor the size of a pea resting in a small cavity formed by disintegration of surrounding brain tissue.

CASE CXVIII. *Symptoms.*—Condition alcohol habit and epileptic; fell in an epileptic convulsion; large haematoma over left frontal and parietal region; three convulsions within first six hours, the last followed by partial paralysis of left lower face. The temperature on the first day was 101.8°, 102.8°, 100°; second to sixth days, inclusive, 100.6° to 102°+; seventh to ninth day, normal; and then for ten days subnormal during the greater part of each twenty-four hours. On the thirteenth day a severe chill was followed by temporary rise of temperature to 101°+; and on the nineteenth day a slighter chill by an elevation of temperature, which progressively increased till death, on the twenty-first day. Until the occurrence of the second chill there were few general symptoms; some remaining paresis and anaesthesia of the right face, more or

less mental aberration, and some delusions. After the second chill strength diminished, the mental condition became sluggish, the respiration rapid, and temperature rose to 105.5°.

Lesions.—Subcortical laceration and excavation of left pre-frontal lobe, with a prolongation backward to a point opposite to the middle of the corpus striatum; no haemorrhages; large subarachnoid serous effusion and opacity of the arachnoid over the whole vertex; general hyperaemia and oedema.

Case CXIX. *Symptoms.*—Consciousness retained; wound in right parietal region; condition alcoholic; heavy sleep during the first night after admission; afterward constant restlessness; some pain in the back of the head; vomiting of everything taken into the stomach; temperature on admission, 102.6°; second day, 105; and at time of death, which occurred somewhat suddenly at the end of the third day, 103.8°; pulse moderately accelerated, 120 to 88; pupils and respiration normal.

Lesions.—Subarachnoid purulent effusion over both frontal lobes, mainly on the left side, with some general oedema of the pia; scanty fibrinous exudation at the base; and fibrinous patches on inner surface of the dura at the convexity.

Case CXX. *Symptoms.*—Absolute unconsciousness till death, an hour and a half after reception of the injury; small wound behind the right ear; dilatation and immobility of both pupils; respiration on admission, 42; an hour later, 21; ceased at death rather suddenly; no cyanosis; pulse feeble and soon became imperceptible; temperature on admission, 98.6°; an hour later, 98.2°.

Lesions.—Probably caused by *contre-coup*, force having been transmitted through the feet and lower extremities; fractures of both tarsi, comminution of both calces and right astragalus, fracture of left leg, and contusion of soles of both feet; pial haemorrhage to extent of several ounces of fluid blood, mainly at the vertex and in larger part on the left side, extending into median fissure, and which had broken through into the arachnoid cavity; also in considerable quantity upon the inferior surface of the cerebellum, about the median line, and covering the pons; no lacerations; excessive general hyperaemia, most strongly marked on the left side and in the pons, optic thalami, and corpora striata, in the order named; thrombosis of minute vessels generally, but most pronounced in the optic thalami and pons; oedema of the pons.

Case CXXI. *Symptoms.*—Primary unconsciousness; and on admission mind confused and speech disconnected; four general convulsions from twelve to twenty-four hours afterward; no control of urine or faeces; second day, semi-consciousness; muscular rigidity in back of the neck and extremities; some irritability; fourth day, mental condition rational, but no remembrance of the manner in which the injury had been received; during the next ten days the urine, but not the faeces, remained uncontrolled; there was noticeable weakness of the muscles

of the trunk, inability to rise or sit up in bed without assistance, dementia and loss of memory, primary union of the wound, and nearly normal pulse and respiration. On the fifteenth day there was somnolence and increase in temperature and infrequency of the pulse and respiration; stupour deepened, and on the seventeenth day unconsciousness was complete. Death occurred in eighteen days. Temperature on admission, 99.4°; fourth day, 99°; till the end of second week, 99° to 100°+; on the seventeenth day, 102.7° to 103.8°; on the eighteenth day, 105.4°. Pulse on admission, 96; normal till fifteenth day; later, 160. Respiration on admission, 26.

Lesions.—Haematoma over right parietal eminence; thrombus in superior longitudinal sinus; great fullness of meningeal veins over the vertex; convolutions flattened; frontal lobes relatively small, parietal lobes bulging as though from distention; general cerebral hyperaemia and oedema without punctate extravasations and with few minute thrombi; substance of cerebellum nearly normal. By compressing posterior portion of the cerebrum and making vertical sections anteriorly, serous fluid exuded in great quantity; little serum in the ventricles. A clot about the size of a large pea and of elliptical form occupied the exact centre of the anterior third of the left optic thalamus. There were no lacerations, haemorrhages, or subarachnoid effusions, and upon microscopical examinations no inflammatory changes.

Case CXXII. *Symptoms.*—Walking case; unconsciousness supervened some hours after injury, and continued till death on the third day; wounds in occipital and both parietal regions; slight dilatation of left pupil. Temperature, 103.6° to 106.6°.

Lesions.—Large pial haemorrhage compressing left fronto-parietal region; excessive general hyperaemia with numerous minute thromboses; subcortical laceration just external to anterior part of left corpus striatum, an inch by half an inch in its diameters.

Case CXXIII. *Symptoms.*—None recognised till admission three days after reception of the injury; partial loss of consciousness; complete right hemiplegia and hemianaesthesia including trunk; complete aphonia; slight dilatation of pupils; bilateral convulsive movements of face and neck with the eyes turned to the right, repeated every five minutes; respiration shallow and hurried; pulse rapid, feeble, and irregular. Temperature, 101° to 104°; radial pulsation fuller and stronger on the left side than on the right. Trephination disclosed arachnoid clot. Death occurred before operation was completed.

Lesions.—Pial haemorrhage with clot covering both frontal and both parietal lobes; right lateral ventricle filled with haemorrhagic serous effusion; general hyperaemia.

Case CXXIV. *Symptoms.*—Walking case; unconsciousness supervened some hours after apparently trival injury; no discoverable external lesion; dilatation of pupils; second day, partial restoration of conscious-

ness; fourth day, delusions; ninth day, stupour; eleventh day, complete unconsciousness. Death at the end of twelfth day. Temperature on the first day, 102.4°; afterward, 101° to 99°; final observation, 100.8°; pulse, 76, gradually increasing in frequency; respiration, 24, 20, 28.

Lesions.—Thin layer of pial haemorrhage which covered the opposing surfaces of the superior median fissure, and spread over left occipital and parietal lobes to margin of the temporal lobe; some blood, also pial, in the left middle fossa; general hyperaemia and moderate oedema.

Case CXXV. *Symptoms.*—Unconsciousness which soon after admission was replaced by delirium; no external injury; loss of urinary control; delirium constant, of a quiet sort by day and violent by night till the seventh day, when for some hours before death it was muttering, or typhoid, in character; mental condition stupid from the beginning; patient was at no time able to give any account of himself, to respond to a question, or to show any appreciation of his surroundings. Death from asthenia on the seventh day. Temperature on admission, 96.2°; rose progressively in three days to 103.2°; on the fourth day was 101.8°; on the fifth day, 103°; on the sixth day, 104.6°; and on the seventh day, 101.2° to 107.2°; post mortem, 107.8°. The pulse did not exceed 100 till late in the week.

Lesions.—Small laceration in the substance of the posterior part of the left frontal lobe; laceration of under part of the corpus callosum in its anterior third, and of the left lateral edge of the fornix anteriorly; small haemorrhage in left lateral ventricle derived from the laceration of the fornix; pial haemorrhage over posterior part of right occipital lobe, upon its border, beneath tentorium, and upon the posterior border of the cerebellum; blood fluid and moderate in amount; moderate general hyperaemia with minute thromboses.

Case CXXVI. *Symptoms.*—Walking case; unconsciousness after some hours' interval; stertor; loss of urinary control; vomiting. Temperature, 101.8°; rose progressively to 107.8°; pulse, 70 to 162; respiration, 24 to 46. Death in eleven hours.

Lesions.—Laceration of superior surface of right parietal lobe; cortical haemorrhage covering whole right hemisphere; general hyperaemia.

Case CXXVII. *Symptoms.*—Unconsciousness, which soon became profound; normal pupils; pulse in a few moments rose from 90 to 140; right side of body and right extremities rigid; bilateral convulsive movements; right radial pulse fuller and stronger than the left. Death in eight hours and a half. Temperature on admission, 97°; in three hours, 101°; in six hours, 102.2°; pulse, 90 to 140 to 136; respiration, 20 18, 21; and just before death, 12 and then 7 in the minute, very full and deep, with cyanosis.

Lesions.—Small contusion of scalp in left middle parietal region discovered only after post mortem incision; thin pial haemorrhage, mostly fluid, covered whole superior and external surfaces of both hemispheres

as far forward as the middle of the frontal lobes, extended in larger quantity over both surfaces and both borders of the cerebellum, and spread over the pons and medulla; pia mater intensely hyperaemic; small contusion on inner border of right temporo-sphenoidal lobe, and a larger one at left parieto-occipital junction; brain substance generally excessively hyperaemic and oedematous, with many small areas of local contusion filled with small haemorrhages as large as a robin shot.

The essential lesion was laceration of the basic ganglia. The right corpus striatum was entirely disintegrated and destroyed; its ventricular surface only remained, as a ragged membranous capsule, of which much had altogether disappeared. The laceration extended anterolaterally into the substance of the right frontal and parietal lobes; it was continued posteriorly through the taenia semicircularis into the anterior part of the optic thalamus. The ventricular surface of the left corpus striatum was contused and marked by small linear lacerations. The fornix and under surface of the corpus callosum were softened and disintegrated. Fluid blood partially filled both lateral ventricles, and in the left had broken through the posterior cornu into the occipital lobe in considerable quantity.

Case CXXVIII. *Symptoms.*—Immediate unconsciousness with some response to external irritations, which continued till final coma; continued dilatation of both pupils, which were sensitive; temporary rigidity of left side; right hemiplegia and hemianaesthesia, and right facial paralysis; restlessness, which was confined to the left side; retention of urine; coma and stertor for five hours before death, which occurred in fifty-three hours. Six hours before death the left hand became icy cold and the left arm and foot cool, while other parts of the body retained a normal surface temperature. At this time the rectal temperature was 102.6°; the left axillary, 100.4°; and the right axillary, 103.2°. In fifteen minutes the temperature in the left axilla rose to 101.4°, and in thirty minutes to 102.8°, while the rectal and right axillary temperatures remained stationary. The axillary temperatures were at other times symmetrical. Temperature on admission was 98.5°, and in two hours, 102.2°; in eleven hours it receded to 101°, in the next twelve hours rose to 105°, on the second day receded to 100.4°, and a few moments before death was 106°; one hour post mortem, 106.2°. The pulse gradually increased in frequency from 110 to 158. The respiration was never below 30, and was finally 56 in the minute.

Lesions.—Contused wound of the scalp over right parietal eminence; slight pial haemorrhage over inferior surface of cerebellum and posterior left occipital border; copious subarachnoid effusion and arachnoid opacity in posterior parietal regions, most marked on the left side; small haemorrhagic serous effusion in left lateral ventricle; limited contusion and slight laceration in the substance of the fornix posteriorly; excessive general hyperaemia and oedema, with a few minute thrombi in all parts of the brain.

Case CXXIX. *Symptoms.*—The patient walked home after a fall of ten feet, had a single convulsion a few hours later, and was stupid or dazed for five days afterward; he then became violently delirious, and was admitted to the hospital. At that time, no visible external injury; pupils moderately dilated; radial pulsations bilaterally symmetrical; posterior cervical muscular rigidity, and loss of urinary control. On the following (seventh) day pupils contracted and muscular rigidity increased; one convulsion since admission; mental condition marked by alternations of stupour, with wild delirium. No change till the eleventh day, when the patient became quieter, and could answer a limited number of questions intelligently. On the fifteenth day the pupils became normal, muscular rigidity diminished, and urinary control was temporarily regained. From the sixteenth day unconsciousness was complete, On the seventeenth day the pupils were again contracted, the respiration was stertorous, and the face cyanotic; the lungs became oedematous, and death occurred on the morning of the nineteenth day. The temperature on admission was 102°, and varied from 99° to 101°+, with occasional elevations to 102°+ till the last thirty-six hours, when it was constant at 105.6°; and half an hour post mortem was 106°. The pulse on admission was 132, and afterward was usually from 96 to 112. The respiration was moderately increased in frequency. Both pulse and respiration were finally greatly accelerated.

Lesions.—Cortical haemorrhage, compressing outer and anterior aspect of right frontal lobe, and filling right anterior fossa. This was derived from a laceration of the inferior surface of the right frontal lobe, which was mainly subcortical, and excavated its inferior and outer portion; cavity as large as a pigeon's egg, and lined by a thin chocolate-coloured and pultaceous substance. Small linear laceration upon inner border of left frontal lobe and slight contusion of anterior portion of right temporosphenoidal lobe, both upon inferior surface. Opacity of arachnoid membrane; no subarachnoid serous effusion, and only very moderate hyperaemia of the brain substance.

Case CXXX. *Symptoms.*—Primary and permanent unconsciousness; restlessness; general muscular rigidity; stertor; irregular pupils. Temperature on admission, 100°, and at death, 99.8°; pulse, 108 to 160—; respiration, 32 to 58. Death in an hour and a half.

Lesions.—No fracture or lacerations; large general subarachnoid and ventricular serous effusion; general hyperaemia and excessive oedema.

GENERAL DIAGNOSIS.

Before attempting to isolate the several forms of encephalic injury, I shall recur to two points in their general diagnosis which have been, at least provisionally, established by the analysis of my first series of cases. I refer to the pathogno-

monic value of temperature in the symptomatology of head injuries as a class, and to the recognition of cranial fracture. I shall not enter at length into the reconsideration of either subject, since the relation between symptoms and demonstrated lesions previously determined is found to still subsist, and the more recent observations have but confirmed the opinions the study of the elder series seemed to warrant. The additional cases have, in fact, not only substantiated but strengthened the propositions which I formulated in the original instance; this will be sufficiently evident by a simple reference to their histories as presented. I shall consider more specifically only the two points in general diagnosis which I have designated.

PRIMARY SUBNORMAL TEMPERATURE.

In all the cases of the first series but two the temperature was elevated at the time of first observation. In the present series, which, like the first, includes recovering as well as fatal cases, the instances of primary subnormal temperature have chanced to be more numerous, but in all which survived primary shock subsequent elevation of temperature was equally noted.

In more than seventy-five per cent. of the forty or more cases of the later series, in which the earliest known temperature was subnormal, the patient still suffered from evident shock or alcoholic intoxication. It is not inconceivable or improbable that in them a characteristic symptom of shock or of alcoholic poison should have taken precedence of others produced by traumatism. In the cases remaining, where no other suggestion of shock or of alcoholism is to be derived from the examination of symptoms, the solution of the problem is probably the same. Premising that the earliest manifestations of injury—those exhibited before admission—are most difficult to learn, it may well happen that depression of temperature, often the last lingering indication of shock, is all that remains when the first record of the case comes to be made. Three of the residual cases were com-

plicated by severe external injury; in many others there was free intracranial haemorrhage, as determined in the majority by necropsic examination, and in the others by the escape of blood during life from ear, nose, or mouth. In one case, in which there was no external haemorrhage, the general conditions indicated its existence within the cranial cavity. In all these instances the occurrence of undiscovered or unnoted shock is not only the rational but more than probable explanation of an otherwise inexplicable early depression of temperature; but whatever may be thought of these exceptional and temporary early conditions, all such cases very soon fall into line and conform to what seems to be an established law—that elevation of temperature is the unfailing manifestation of traumatic lesions within the cranium.

The character of the pulse and respiration in the exceptional instances in which subnormal temperature was observed has not been usually suggestive of general shock; in a few cases the one was notably frequent or the other markedly accelerated; in general there was little if any variation from the normal standard. This requires for explanation but another application of the suggested law of precedence in symptomatology; it may happen that the pulse and respiration reflect for a time the general condition of shock, but it is more frequently the temperature alone which in the presence of intracranial injury is dominated by the original impression made upon the sympathetic nervous system. In all cases, if the patient survives a certain very limited period, temperature, pulse, and respiration, like all other symptoms, are dependent upon the special injury which has been suffered, and this is ordinarily the fact at the earliest opportunity afforded for examination. It is sufficient to indicate this law of preference without attempting to fathom the conditions upon which it rests.

I have previously insisted in this relation of temperature to general diagnosis upon the importance of distinguishing alcoholic coma from cerebral trauma. I have no less strenu-

ously asserted the facility, the almost absolute certainty, with which this can be accomplished. I believe the elevation of the temperature in the one, and its depression in the other, have been so thoroughly established as to demonstrate the sufficiency of temperature alone, without the existence of external injury or positive general symptoms, in almost any case in which question may arise. It is fortunate that the occasional early depressions of temperature in intracranial injury are likely to be associated with such general conditions as have little room for doubt in diagnosis. I have no reason to revert to a subject so simple in itself, except in the interest of humanity and in protest of the shocking abuses which still persist in this regard in the accident service of the city. Negligence or incompetence still figures in the early history of too many of the serious cranial and intracranial injuries which have at a later period come under my observation. There may be a fair presumption that a man found unconscious in the street, or delirious in a police station, is simply drunk and devoid of surgical interest, but it is not so absolutely overwhelming as to warrant neglect of ordinary physical examination; and when by grace of ambulance surgeon a patient with fractured skull and lacerated brain, whether or not in alcoholic condition, is admitted, it is not creditable to hospital administration that he should be detained in alcoholic wards, transferred to an asylum for the insane, or sent into the street to die almost within the shadow of its walls, even in exceptional instances. It must be in some part due to a defect in professional teaching when hospital assistants display such ignorance or indifference in the discharge of professional duty. It is well, therefore, for observers who are not public teachers to assume an office, and to direct attention to such default if for no better purpose than to avert public scandal.

FRACTURES OF THE CRANIUM.

The diagnosis of fractured skull is not difficult if the case be subjected to sufficiently careful examination. This is evident in some degree from anatomical considerations, and is illustrated in my first series of cases. Fractures of the vertex can always be discovered by tactile or visual sense, since incision is without danger or subsequent inconvenience to the patient, when doubt exists which it seems important to resolve. Fractures of the base in a large proportion of cases traverse some part of the bone which permits the escape of blood from the ear, nose, or mouth, or into the subconjunctival or subcutaneous cellular tissue. In fifty per cent. of the eighty-seven necropsies in both series in which fracture of the base existed, there had been some form of external haemorrhage during life; in more than seventy-five per cent. of the seventy-eight cases which recovered, or in which necropsy was impracticable, there had also been some characteristic haemorrhage, so that in 62.5 per cent. of the total number diagnosis could be made largely from this single symptom. Two of the remaining sixty cases presented an equally characteristic serous discharge, and many others had been recognized by tracing fissures from the vertex downward into the base in the course of operation. There are left scarcely more than twenty cases in which this fracture was unknown till disclosed at necropsy, and of these several were brought under observation only after the lapse of one or more days, too late to ascertain whether or not haemorrhage, usually a transient symptom, had occurred. In this residuum of cases the fracture very frequently extended into the middle or posterior fossa without reaching the petrous portion, and sometimes into that bone without involving any part of the auditory passages; fracture through the anterior or middle fossa in some instances failed to so implicate the ethmoid or sphenoid as to establish communication with the nose or mouth; in the anterior fossa the thin orbital bones were occasionally fissured without causing either orbital or ocular haemorrhage, visible or con-

cealed. Yet, with all these possibilities of failure of recognition as a symptom, its absence altogether, its lack of means of exit, the neglect of its early observance, external haemorrhage was noted in nearly four out of five of the whole large number of cases which I have recorded.

I do not think there is the serious difficulty which has been suggested in determining whether such haemorrhage is the result of fracture. The local examination of ear, nose, or mouth is sufficient to eliminate the most probable source of error. Contusions of the face in the ophthalmic region may sometimes make orbital or ocular haemorrhage of doubtful significance, and habitual epistaxis has once led me to hesitate in the interpretation of a nasal haemorrhage; but it is usually possible in such instances to give this symptom its proper clinical value. I believe it may be regarded as practically pathognomonic. I have only once found a haemorrhage from the ear to result from a wound of the external meatus.

An occasional escape of brain substance through a cranial fracture requires no consideration. The more frequent instance of injury of a cranial nerve from a fracture passing through its bony canal may be diagnostic if it be practicable to fairly determine that functional disturbance or abeyance does not depend upon lesion within the intracranial cavity. I have recorded in the first series an instance of facial paralysis which was found upon necropsy to have been occasioned by fracture and haemorrhage into the aquaeductus Fallopii, and I have had reason in more recent recovering cases to refer the same symptom to similar osseous lesion. It is well known that fracture through an anterior fossa often involves the optic foramen. I have recorded the history of three cases, in which the patient survived, where the optic nerve was thus implicated and suffered subsequent atrophy with immediate and permanent loss of vision. Dr. P. A. Callon has reported nine cases. I have no doubt, therefore, that valuable diagnostic information may be afforded by nerve disturbance mechanically produced.

There remains a symptom which I believe to point to fracture, and to which I have previously adverted, in the existence of acute localized pain at the seat of the injury. I have since observed it in a number of cases in which this lesion seemed otherwise probable ; these often resulted in recovery, and, as the indications of intracranial complication were slight, the symptom was unobserved. I quote an illustrative cause which occurred in my service at St. Vincent's Hospital :

A young woman fell from a third-story window to the pavement below and was admitted at once, delirious, with haematoma of the left frontal region extending over the eye, and with slight subconjunctival haemorrhage. She had epistaxis, which was repeated the next day, and from which she said she had previously suffered ; no fracture was discovered by incision ; severe frontal headache, confined to the site of the haematoma, continued for three days ; the mind was clear ; the wound of incision healed at once ; the temperature on admission was 101.4°, rose gradually to 103° on the third day, and then declined to 99° on the ninth day ; the pulse on admission was 68, and on the sixth day, 120.

The degree and course of temperature in this case indicated injury of the brain, and while neither the epistaxis nor the ocular haemorrhage could be postively attributed to fracture, the severity of the blow, amount of local injury, and coexistence of brain lesion, gave to my mind a certain diagnostic importance to a severe localized pain which was certainly not characteristic of simple contusion. I shall have occasion to detail in another connection some fatal cases in which the value of this symptom was incidently verified.

The symptoms usually ascribed to fracture—as loss of consciousness, pupillary change, and others—are really those of encephalic complication, and have only a possible indirect relation to cranial injury.

In assuming that fractures are themselves unimportant, except for their complications, immediate or remote, I have

not depreciated the importance of their diagnosis. Fractures of the vault induce complications, which are relieved only after recognition and treatment of the fracture itself. Laceration of the brain, wounds of the sinuses, haemorrhage, and later psychical disorders caused by fragments of bone depressed, can be treated only after detection of the primary lesion. Basic fractures are less likely to require or admit direct interference; but their appreciation is still of moment. The knowledge that fracture exists may greatly help to confirm the diagnosis of a deeper seated injury, and greater certainty in regard to the existence and nature of morbid conditions can not fail to increase the possibilities of successful treatment. The curative management of intracranial lesions is still so far unsettled that aid from any quarter, in giving it firmer basis, is far from unimportant.

DIFFERENTIAL DIAGNOSIS.

When the transition is made from general to special diagnosis, and beyond the simple recognition of fracture to the differentiation of intracranial injuries, difficulties increase, and these, I have found, are to be encountered and surmounted, if at all, with little aid from other than personal observations. The literature of the subject, aside from the contributions of Prescott, Hewitt, and Von Bergmann, is singularly unsatisfactory, and the most recent surgical writers even are hopelessly confused in their descriptions of these obscurer forms of injury. There has been no lack of tabulated collections of cases, but they have been disjointed and heterogeneous, incomplete in historical detail, and barren of result for any purpose of useful generalization. They have presented a jumble of symptoms, lesions, and pathic relations, at once perplexing and discouraging. I limit criticism to methods of culture which have obtained in the field of traumatism, and have no intent to disparage the work which has been done in other departments of neuro-pathology.

I have no hesitation in ascribing this want of precision primarily to an erroneous conception of the structural altera-

tions which such traumatisms produce, and to a consequent failure to either accurately define the resultant morbid conditions or to systematize the symptoms which they present. Following an imperfect apprehension of the nature and effects of structural lesions, intracranial injuries have been considered largely in the light of theoretical preconceptions. Mistaken views of both pathology and symptomatology, strengthened by time and tradition, have retained acceptance, or have been formally discarded, only to be again practically rehabilitated. Recognition is still given to a hypothetical disorder which is without pathological foundation; symptoms are still grouped under a single comprehensive designation, which result from varied pathogenic conditions, and which present as many points of contrast as of similitude; fact has been subordinated to fancy in order to establish antitheses which are inaccurate in every particular; a comprehensive inflammation of the entire cranial contents has been assumed which has no basis of truth. Concussion, compression, encephalitis, are terms which still hold place in the vocabulary of surgical literature. I have heretofore considered the subject of concussion, and shall recur to compression and encephalitis hereafter.

In a previous paper, of which this is a continuation, and to which I am so often compelled to refer, I detailed the traumatic lesions which were revealed in a considerable number of necropsic examinations, and made them the basis of classification of the morbid conditions which they had occasioned. In an even larger number of necropsies observed since that time parallel conditions have been found to exist. As each form of lesion is attended by characteristic symptoms, and as no evidence is adduced that symptoms occur independent of anatomical alteration, it is logical and, I think, essential to recognize groups of symptoms under the name of their pathogenic lesion. The attempt to classify tramautic or other diseases by their outward manifestations is arbitrary, misleading, unphilosophical, and contrary to what has come to be accepted as the true principle of nosography. It is

beyond my province to insist upon the proper basis of nosology, which has been so learnedly demonstrated and so felicitously formulated by my distinguished colleague, Dr. J. W. S. Gouley.[1]

These lesions, reaffirmed in brief, are: (1) Intracranial haemorrhages from injury of the bone, brain, or membranes; (2) arachnitis, from injury of the arachnoid membrane and pia mater; (3) lacerations and contusions of the brain substance; to which may be added (4) pyogenic parenchymatous inflammation.

I omit reference to disorganizing injuries in which the brain and its membranes are alike involved; they are patent and have no relation to classification. There is another lesion—thrombosis of the dural sinuses, which I have been unable to connect with symptoms.

The prevalence of errors in pathology and of faulty generalizations in symptomatology, together with the inherent force which they derive from prescription, may be reckoned extrinsic causes of diagnostic uncertainty. Some of the sources of confusion and failure which I indicated in a previous study of head injuries may be regarded as intrinsic. In the second class the multiplication of lesions in the same case and the apparent identity of symptoms from dissimilar causes may be counted as most efficient. I believe the "Ariadnean thread" should be sought in the study of those cases in which the lesion is either simple or in which one out of many is primary and of paramount importance. The clew once gained it ought to be possible to follow it through the more complicated cases.

II. HAEMORRHAGE.

Traumatic intracranial haemorrhages are usually classified as (1) epidural, (2) subdural, and (3) cortical or pial. This is hardly accurate or complete, though not absolutely objectionable. No exception can be taken to the term epidural

[1] *Diseases of Man—Nomenclature, Classification, and Genesis.* Dr. John W. S. Gouley, Surgeon to Bellevue Hospital, New York, 1888.

as denominative of an extravasation between the bone and the dura mater, for it is anatomically correct. The use of the word subdural is less felicitous, since the effusion is into the arachnoid cavity and not between the dura and the parietal arachnoid. Haemorrhages, again, which occur between the visceral arachnoid and the brain are better subdivided, so as to imply cause as well as location. A more accurate classification of haemorrhages, if made purely in accordance with location, would be: (1) Epidural, (2) arachnoid, (3) subarachnoid; but as the arachnoid variety is merely an accidental extension of any subarachnoid haemorrhage, and as the subarachnoid is of composite origin, a better, and I believe the best possible, subdivision is into (1) epidural, (2) pial, (3) cortical.

The matter of nomenclature is of absolute importance, since pathological exactness is essential to correct diagnosis, and a change of established form, always to be deprecated, becomes in this instance a logical necessity.

I at one time believed epidural haemorrhage to invariably result from cranial fracture. I have more recently seen three cases in which it was occasioned by contusion from *contre-coup*. Its source may be either in the diploe or in the osseo-dural vascular connection. Pial haemorrhage is caused by contusion of the pia mater and consequent rupture of its vessels, while cortical haemorrhage, though occupying the same anatomical position in the subarachnoid spaces, is derived from laceration of the brain surface. These three haemorrhages are always primary; arachnoid haemorrhage, as I have stated, is always secondary. It is in most cases a cortical haemorrhage which breaks through the pia and visceral arachnoid; a pial haemorrhage from contusion is not often in sufficient amount to rupture the arachnoid membrane, though an occasional instance will be found in the histories which I have presented. That blood from the osseo dural vessels may reach the arachnoid cavity when the injury at the same time involves both bone and dura is evident, but that no epidural haemorrhage in itself has power

to rend the dura seems equally certain; the fibrous structure resists while the brain substance is compressed and displaced, even though blood is effused in enormous and fatal quantity.

Intracerebral haemorrhage is the result of subcortical laceration, or rather a part of it, and therefore not a distinctive lesion.

The differential diagnosis of haemorrhage is of special importance, since of all the intracranial lesions it most frequently admits of operative interference. Its origin and location are no less important as constituting a second factor in determining the propriety of operation.

A casual examination of the cases which I have recorded will demonstrate the exceeding frequency of haemorrhage in all forms of intracranial injury. In nearly sixty per cent. it has occurred in sufficient quantity and in such relation as to largely influence the final result, and to become a more or less determinate factor in the genesis of symptoms. In one third of this percentage it has been the direct and probably the sole cause of a fatal termination. It is doubtful, however, if it is ever an isolated lesion. In a very large proportion of the whole number it was secondary to laceration, and while this was in itself often insignificant, the haemorrhage was none the less profuse and the source of both symptoms and danger. In the residue of cases, though it was primary, it was not unexpectedly associated with other structural alterations. The same violence which is sufficient to separate the dura from the bone, or to rupture the vessels of the pia mater, can hardly fail to be transmitted to the brain, and its effect either concentrated in a local laceration by *contrecoup* or diffused in a general contusion of its substance. A haemorrhage is often regarded as uncomplicated from want of sufficiently careful necropsic inspection of the brain throughout its whole extent. There may be no laceration or other obvious local injury, and general contusion is readily overlooked.

I have but once observed in necropsy a haemorrhage where the associated cerebral contusion seemed so slight as

to be unimportant. There are twenty or more cases, however, in which haemorrhage was the essential lesion, and which, perhaps, afford sufficient ground for inductive examination. There is probably a larger number than I shall analyze, but it is impossible to rate them with even approximate precision. They include nine epidural haemorrhages and eleven of pial or cortical origin, of which five had reached the arachnoid cavity. If to these are added eight cases which were subjected to trephination, and in which the existence and location of haemorrhage was thus verified by operation, and in which no considerable depression of bone or other evident complicating lesion existed, the total number will be increased to twenty-eight. One of the operative cases disclosed both epidural and arachnoid haemorrhage, and terminated in death; the others were all of epidural character, and resulted in recovery.

The symptoms observed were not numerous, and of these temperature, when considered with proper regard to its surrounding conditions, was of greatest diagnostic significance. In seven of the necropsic cases it was unrecorded; in seven of those remaining it was on admission subnormal; in five it was 99° to 99°+; and in one, which also involved slight contusion of the corpus striatum, it was 101°. In those cases, three in number, in which it subsequently exceeded 101°, there were notable coexistent lesions of the brain substance; one presented extensive lacerations of the base, another extensive general hyperaemia and oedema, and in a third, in which the temperature rose from 94° to 102° in the eight to ten hours which preceded death, there was implication of a supposed heat centre. In the operative cases the highest temperature was 101.6°, and in the only one in which it exceeded that degree it reached 102° after the formation of a fungus cerebri. I have already attributed the early subnormal temperature to shock, and, when the patient has survived this condition, I have seen that the temperature has been restored with the general reaction. In each case in which subsequent elevation exceeded 101°+

there has been marked general contusion or other concomitant injury of the parenchyma of the brain. In these twenty-eight cases, therefore, best fitted for observation, the temperature characteristic of haemorrhage has been found to range from above normal to 101°+.

The one constant symptom in fatal cases was some degree of unconsciousness. In the majority it was profound, or at least complete, from the moment of injury to the end of life. In four others consciousness was primarily lost, and, after more or less complete restoration, was merged in final coma. In three instances consciousness was retained for some length of time, during which the patient walked for a considerable distance, and then either gradually or suddenly became unconscious. In another case of late unconsciousness delirium followed, and continued till death occurred. In a final instance unconsciousness was primary, but, as in the case just mentioned, delirium followed hard upon it without a period of conscious intelligence. In the operative cases in which recovery ensued, and in which it is fair to assume that the effusion was smaller, loss of consciousness was less constant, occurring in but half their number. In two the mental condition remained unaffected, and in one unconsciousness was replaced by delirium; in three cases in which it was a symptom, it was very transitory in two, and in one but moderately prolonged.

The varying phases of unconsciousness, the diverse symptomatic conditions with which it is associated, and the uncertain period of its occurrence, render it impossible to accept the traditional explanation of its existence, that it is solely dependent upon a mechanical compression of the subjacent brain substance. It is probable that as a primary symptom—as an instantaneous result of injury—it is due to general contusion, which is itself an instantaneous lesion. It has been seen in the larger number of the fatal cases collated that it has been absolutely the first symptom, not only at the time of admission, but as learned at the scene of accident and noted in the ambulance history. The effusion of a

sufficient amount of blood to act mechanically requires an appreciable interval. This is evident in two of the cases of rupture of the arteria meningea media, in which some hours elapsed before the patient became unconscious, and in which the epidural clot was found to be of enormous size. There may or may not be a restoration of the intellectual faculties between the earlier and the later lapses of consciousness. The general cerebral contusion may be so severe that the unconsciousness which it produces will continue till the effusion has become sufficient to occasion the same condition as a direct result, and one is lost in the other. It is also possible that the central lesion may be insufficient to annul consciousness for the time necessary to the effusion of blood in sufficient quantity to act as an immediate stupefying agent. This opinion as to the manner in which loss of consciousness occurs in intracranial lesions will be strengthened by the wider comparison of cases to be made, in which haemorrhage was a contributive rather than an essential lesion, and in the direct study of other forms of injury.

Much importance has been attached to disturbance of the pupils in traumatic haemorrhage. The cases under present consideration in most instances show some change in the pupillary condition. It has been unnoted in two of those which were fatal, and in three of those which were subjected to operation; it has been normal in but three out of the remaining twenty-three. The pupils in the cases of abnormality have afforded almost every possible combination of dilatation with contraction. In six both pupils were dilated, the haemorrhage being in three epidural, in two pio-arachnoid, and in one epidural and pio-arachnoid combined. In four both pupils were contracted, the haemorrhage being in one epidural, in one pial, in one both epidural and arachnoid, and in both epidural and cortical. In two the pupil was dilated on the side of injury and contracted on the opposite side, the haemorrhage in each being epidural; in two the pupil was contracted on the side of injury and dilated on the opposite side, the haemorrhage in each being

epidural and derived from the middle meningeal artery; in three the pupil was dilated on the side of injury and normal on the opposite side, the haemorrhage in each being epidural; in three the pupil was normal on the side of injury and dilated on the opposite side, the haemorrhage being cortical in two and epidural in one. There was no instance of contracted pupil on either side without change in its fellow. In the three cases in which both pupils remained normal the haemorrhage was epidural in one, pial in another, and cortical in the third. The haemorrhages occurred upon every part of the cerebral and cerebellar surfaces, vertex, and base.

There seems to be no change in the pupils, Hutchinsonian or otherwise, which is positively characteristic. In two thirds of the cases analysed the haemorrhage was wholly or in part epidural, and in two thirds of these again one pupil or both was dilated; but as in the aggregate all sorts of pupillary changes resulted from all sorts of haemorrhages, their observation can be scarcely more than confirmatory of an opinion justified by the collation of other symptoms. Their condition as to mobility was scarcely more to the purpose; in the far greater number, whatever the origin, location, or amount of haemorrhage might be, they were freely movable.

The pulse was unnoted in three cases; it was normal in four, in two of which the haemorrhage was epidural, covering the convex surface of a hemisphere, and in two was of subarachnoid origin, occupying the inferior occipital fossae. In the larger number of cases it was frequent, and the haemorrhage, usually large, was of either variety and variously situated. In six cases in which the pulse was slow, the haemorrhage was in each instance epidural, and the patient profoundly unconscious, and in four the respiration was stertorous. In neither the fatal nor the operative cases was there any definite relation discovered between the character of the pulse and the nature of the haemorrhage, or between it and the associated symptoms.

There is another pulse condition, a want of symmetry in

radial pulsation upon the two sides of the body, which I have found to occur in connection with both haemorrhages and visceral injuries, and shall give consideration hereafter.

The respiration afforded more definite indications. It was normal in but a single instance. It was increased in frequency in two cases moderately, and very markedly or excessively in six others, the haemorrhage having occurred with a single exception upon the convex surface of the brain. In nine cases the respiration was stertorous, and in seven of them the haemorrhage, which was epidural in six, not only covered, but compressed the cerebral surface upon the side of injury or occupied the anterior fossae; in the other two it was rapid, accompanied by cyanosis and pulmonary oedema, and the haemorrhage covered the pons and to some extent the medulla. None of the operative recovering cases presented any noticeable deviations from normal respiration.

The disturbance or abrogation of muscular function was an occasional symptom, and was exhibited in accordance with established laws of cerebral localisation. Paralysis occurred in three of the fatal cases and in two of those which recovered after operation; it was hemiplegic in four and paraplegic in one. Muscular rigidity, affecting one side or both, occurred in five cases, and general convulsions in one which was fatal. In each case some part of a motor area was covered by the haemorrhage, which was indifferently epidural, cortical, or pial, and acted as a paralysing or irritant lesion according to its extent and situation. These motor disturbances, while of great positive diagnostic importance, are so frequently absent that they have no corresponding negative value.

In a single case there was protrusion of both eyes as well as dilatation of both pupils. There was found an epidural clot in the right inferior occipital fossa, and an arachnoid haemorrhage which covered both frontal and the parietal lobes as far as the fissure of Rolando.

Sensory disturbances were still more infrequent. Delirium was noted in three cases: in one which recovered it was pri-

mary, and the haemorrhage, as disclosed by the trephine, was epidural and in trivial amount; in two fatal cases it was of later occurrence, followed a previous condition of unconsciousness, and was associated, in one with a pial haemorrhage over the right hemisphere and inferior surface of both occipital lobes, and in the other with a cortical haemorrhage covering the pons; in both general contusion was well marked. Partial anaesthesia, irritability, and restlessness were observed in isolated cases.

In order to further test the diagnostic value of the symptoms observed in this limited number of cases, I have analysed thirty-four others in which, though the associated lesions were more severe, the haemorrhage was sufficiently large, absolutely or relatively, to be a probable source of distinguishable symptoms. They present some points of difference which naturally followed from different attendant conditions. In the large proportion of both necropsic and operative cases, in which haemorrhage seemed to be the single source of danger, it was of epidural origin. In the present group of cases, in which the brain and its membranes are more seriously involved, it is with few exceptions essentially pial or cortical. When these parts are the seat of excessive general contusion without laceration, the pial vessels are naturally the ones most likely to suffer rupture, and in fact in every such instance the haemorrhage, if subdural, was of this character; in two it chanced to be epidural. When the brain substance is superficially wounded, the cortical vessels are obviously most likely to be the source of haemorrhage. It is also inevitable that when life is prolonged the symptoms of haemorrhage should be often modified, superseded, or complicated, by others characteristic of the additional lesions.

The temperature loses its diagnostic importance. It is generally higher than in the previous instances where haemorrhage was less complicated. In ten cases it ranged from 105° to 107.8°, and in twenty-six it was above 103°. In the cases which terminated fatally within twenty-four hours,

which was the limit of life ascribed solely to haemorrhage, the temperature, as in them, did not usually exceed 101°+; in four, however, in which death occurred within even less than twelve hours, it rose to 102.2°, 106.8°, 107.8°, and 103°. Subnormal temperatures on admission were infrequent.

Consciousness in these cases, as was noted in those subjected to operation, was less uniformly lost than when death seemed to result directly from haemorrhage, yet in far the larger number its loss was primary, complete, and permanent. In some it was at first partial, but progressive, and eventually complete; in others primary unconsciousness merged in delirium; in a few instances consciousness was at first retained, only to be lost at a later period. In general, the results of this examination are confirmatory of those obtained from the study of the less complicated cases.

The pupillary condition was less diversified than in the cases previously detailed. It was normal in about the same proportion of those in which record was made. There was much more frequent dilatation of both pupils—more than twofold; an equal number in which both were contracted, and consequently fewer instances in which the two presented opposite conditions. As before, there was no case in which one pupil was contracted without change in its fellow. When both pupils were abnormal the haemorrhage was usually bilateral; and in unilateral dilatation the haemorrhage was usually upon the corresponding side; but in neither instance was the rule invariable. In the two cases of normal pupils the haemorrhage, which was large in each, was epidural in one and pial in the other, and in each was associated with important change in the brain substance.

The pulse when registered, was, perhaps, under the influence of opposing forces, usually normal. It was occasionally slow or unduly frequent, but oftener exhibited that want of symmetry in force and fullness upon the two sides

which I have mentioned as occurring in different forms of intracranial injury.

The respiration was unnoted in a third of the cases, and in many of these, which were among my earlier observations, it was doubtless unaffected, since at that time normal conditions were unrecorded. If moderate allowance be made for such omissions, the proportion of mixed cases in which its frequency was from 18 to 24 in the minute, and in which it was without special characteristics, was from one third to one half, while in those in which haemorrhage was more nearly an isolated lesion it was of normal character in but a single instance. It was stertorous in about the same proportion of cases as in the former class, so that those remaining, in which it was abnormally slow or frequent, are necessarily few.

The muscular system again not infrequently afforded symptomatic indications. In each instance in which an irregular excitation of functional activity was manifested by either clonic or tetanic contraction the haemorrhage was complicated by cerebral or cerebellar laceration. In others, in which muscular power was lost or held in abeyance, the complicating lesion was invariably general contusion. Clonic contractions were relatively frequent; general convulsions, while but once observed in the class of comparatively pure haemorrhages, and then as merely localized convulsive movements, occurred in six of the mixed cases. General muscular rigidity in the two classes occurred with more nearly equal frequency. These facts are suggestive of the influences exerted by different lesions.

Since, in the group of cases under consideration, the haemorrhage is in each instance associated with some serious injury of the immediate seat of sensory and intellectual function, symptoms which depend upon disturbance rather than upon simple oppression of the nerve centres are to be regarded here as only indirect. Delirium, irritability, or restlessness, when of immediate occurrence, and the effusion of blood is moderate in amount, may be considered

symptoms of haemorrhage, but only in the sense that a pleuritic pain is counted a symptom of pneumonia. It is unnecessary, therefore, where direct brain injury is a recognized factor, to investigate such conditions while engaged in the study of uncomplicated haemorrhages.

There are two symptoms which have been often held to be diagnostic of intracranial haemorrhage; these are loss of consciousness following cranial injury after some appreciable interval, and dilatation of the pupil. This view is not well sustained by the statistical facts which I have collated. Reference to either group of cases will disclose comparatively few instances in which consciousness was lost in the manner indicated. Some change in the pupillary condition was found to occur in most of them, but it was varied in character and not to be regarded as typical in any one of its forms. Various other symptomatic manifestations have been suggested as indicative of this particular lesion. Some of them, like the dilated and insensible pupil, occur often enough to afford corroboration of an opinion founded upon other evidence; others which are possible, but, in fact, infrequent, are given an exaggerated diagnostic importance; and others still, when they chance to exist, have no relation to haemorrhage. The absolute value to be attached to these refuted pathognomic symptoms can be only determined by a reference to the results of actual observations in such an extended series of cases as I have in this instance collected.

II. SUBARACHNOID SEROUS TRANSUDATION.

In place of a haemorrhage a subarachnoid serous effusion is sometimes encountered which is not of inflammatory origin. I first called attention two years ago to a special contusion of the membranes as the immediate cause of traumatic arachnitis. Such a contusion may occasion either a simple meningeal hyperaemia, a pial haemorrhage, a dropsical subarachnoid serous effusion, or some grade of meningeal inflammation.

The dropsical transudation is not of frequent occurrence, and perhaps not easily distinguished from a low grade of inflammatory exudation. If it occurs over limited areas without subarachnoid clot, and without opacity of the arachnoid membrane, or other evidence of the inflammatory process there would seem to be little doubt of its nature. All these conditions rarely concur, but there are at least three such instances in my later series of cases, and in two of them the very early fatal termination, within a few hours only, corroborated the opinion formed from necropsic examination. This oedema, like simple hyperaemia, is found to exist in the presence of more serious organic changes, so that it is impossible to connect it with symptomatic conditions.

III. ARACHNITIS.

The impression conveyed by many surgical writers is that traumatic arachnitis is of rather frequent occurrence, and a constant menace in the convalescence of all cases of intracranial injury. My personal observation has led to a different conclusion. If serous effusions of positive or probable congestive origin, and a limited number of meningeal inflammations which were without apparent influence in the progress of other and directly fatal lesions, are excluded, there remain but thirteen cases in which arachnitis was undoubtedly existent and at the same time influential in compassing the final result. These comprised six in which the effusion was purulent, and seven in which it was serofibrinous, in one of which the presence of the *Streptococcus pyogenes* was demonstrated by culture. In one of the acute cases the purulent formation was the extension of a more profuse pyogenic process along the course of a drainage-tube which traversed the brain substance, and in another it was an equally direct extension from an infected compound fracture which lacerated the membranes and cerebral cortex. In both, the symptoms were merged in those of the primary lesion. The number of cases use-

ful for purposes of analysis is thus reduced to eleven, in none of which the inflammatory process seemed to be propagated from a localized injury of the brain or membranes. They are too few in number to afford a basis for any wide generalization in either symptomatology or diagnosis. The course of traumatic arachnitis, however, is not unlike that of the idiopathic form, and conclusions are thus less dependent upon direct observation than in the study of other intracranial lesions. These cases are at the same time in sufficient number to make their analysis important and to justify an epitome of their already abstracted histories.

Case I. *Acute.*—Primary symptoms referable to depressed fracture, subcortical laceration, and general contusion. On the second day, patient irritable and somnolent. Temperature, 102°; bone elevated. Fourth day, temperature, 105°. Fifth day, patient delirious, restless, and sensitive to external impressions; surface hot, pupils moderately dilated and slow to act, and coma which continued till death on the seventh day. Temperature varied from 104°+ in the morning to 105°+ in the evening; pulse and respiration much increased in frequency.

Lesions.—Fracture of base and vertex; lacerations, pial haemorrhage, and contusions of brain and membranes; purulent effusion over occipital and posterior parietal lobes on both sides, and in inferior occipital fossa of the side of injury.

Case II. *Acute.*—No primary symptoms. On second day, temperature, 101.6°; and afterward 99°+ till the tenth day, when without the occurrence of intervening symptoms it rose to 101°+, on the next day to 104.6°, and afterward varied from 103° to 104°+ till the fifteenth day, when it began to rise progressively and reached 107.4° on the sixteenth day shortly before death. On the tenth day, coincident with the rise in the temperature, the patient became restless and slightly delirious; on the eleventh day he had a slight chill and increased delirium; on the fourteenth day there was posterior cervical rigidity, and on the fifteenth a slight general convulsion. The pupils and respiration were normal, pulse was 104 to 112, and mental condition sluggish.

Lesions.—Fracture of vertex which was confined to external table; purulent effusion over both frontal lobes, encroaching upon parietal and extending into median fissure.

Case III. *Acute.*—Patient in alcoholic condition; restlessness succeeded by stupour, occipital pain, with epigastric pain and vomiting. Temperature on admission, 102.6°; next day, 105°; and third day, 103.8°;

pulse moderately accelerated, 120 to 84; respiration not above 24, and pupils normal.

Lesions.—Subarachnoid serous effusion; much purulent effusion anteriorly upon both sides of the vertex, but mainly upon the left.

In each of the previous instances the presence of the streptococcus was demonstrated by culture.

CASE IV. *Subacute.*—Primary symptoms from subcortical laceration and general contusion, which subsided through second and third weeks. Temperature fell to below 100°, and patient became asthenic. Three days before death he became unconscious, and the temperature rose to 100°+, and on the next day to 103.8°; then varied from 103° to 104.8°, and later rose progressively to 109°. There were alternating periods of rational intelligence and of wild delirium up to the time of final unconsciousness.

Lesions.—Subcortical laceration and excavation of an entire frontal lobe, and excessive general hyperaemia; serous effusion over all parts of the brain with well-marked arachnoid opacity.

CASE V. *Subacute.*—Primary symptoms of general contusion and of lesion of the motor area. Fourth and last week, mental apathy replaced by mild delirium; three days before death temperature rose from 99° to 104°, declined to 100° on the following day, and again rose to 104°. Death occurred on the twenty-eighth day.

Lesions.—General contusion and a small superficial cavity from a local contusion in the leg area of one side; serous effusion compressing both frontal lobes.

CASE VI. *Subacute.*—Primary symptoms of cerebral injury; temperature did not exceed 99°+ for the first week, then rose suddenly to 102.8° to 103.2°, and afterward varied irregularly from 99° to 104°; pulse and respiration only became frequent at the last; mental condition alternately stupid and delirious from the beginning. Death occurred in sixteen days.

Lesions.—Fracture of the base, laceration of both frontal, and of one temporo-sphenoidal lobe; subarachnoid clot in occipital region; general serous effusion with arachnoid opacity.

CASE VII. *Subacute.*—Primary symptoms from cerebral contusion which continued three weeks. Temperature in second and third weeks, 98.5° to 99°+, with progressive mental improvement. In the fourth week the mental condition deteriorated. On the twenty-third day, temperature, 101°; in the four days following it varied from 98.5° to 101.6°, and the pulse was frequent; on the twenty-seventh day, temperature rose from 100.6° to 106.6° without recession, and in the right axilla was from half a degree to a degree and two tenths higher than in the left; on the twenty-eighth and last day it was 108°, and the pulse, previously frequent, was from 54 to 74. The respiration was accelerated during the last two days, and the patient became irritable and restless.

Lesions.—Fracture of the base, several necrotic contusions upon the superior surface of the prefrontal lobes; general contusion with oedema; and general serous effusion over superior and lateral surfaces of the brain.

Case VIII. *Subacute.*—Primary symptoms from parenchymatous injury. Temperature normal from sixth to ninth day, and afterward much of the time subnormal till the thirteenth day, when a severe chill was accompanied by an elevation to 101°+. A second chill on the nineteenth day was followed by a progressive rise of temperature to 105.5° at death on the twenty-first day. After the second chill the patient grew mentally sluggish and became weaker; pulse and respiration were frequent.

Lesions.—General contusion of the brain with oedema; subcortical laceration of a frontal lobe; and serous effusion with arachnoid opacity over superior and lateral cerebral surfaces.

Case IX. *Subacute.*—Primary symptoms, those of general contusion, followed by an intercurrent bronchitis. On the thirteenth day, occipital headache, which became general; somnolence and irritability; temperature, 101° to 104°, and on the eighteenth day, 105°, with delirium and post-cervical rigidity; later, increased delirium and somnolence, with symptoms referable to implication of cranial and spinal nerves; progressive emaciation; lack of urinary and faecal control; rapid and insufficient respiration; unconsciousness and death on the thirty-first day. Temperature from 100° to 104°; pulse, 64 to 90; axillary temperatures variable, and when unsymmetrical, more frequently half a degree higher on the side opposite original injury.

Lesions.—Fracture of the base, thrombi in the lateral sinuses, general contusion of the brain with oedema; turbid serous effusion in the ventricles and at the base; thick membranous effusion over the pons, medulla, inferior surface of the cerebellum, and in the fissure of Sylvius; fornix much softened, and trivial lacerations of one temporo-sphenoidal lobe. The *Streptococcus pyogenes* was discovered in cultures of the membranous effusion.

Case X. *Subacute.*—Primary symptoms of general contusion; unconsciousness which merged in final coma; restlessness; pupils widely dilated but responsive to light; urine retained; left side temporarily rigid; right side paretic; pulse and respiration continuously frequent; temperature on admission normal; subsequent variations: 102.2°, 101°, 101°+, 102°, 105°, 104°+, 102°+, 100°+, 101°+, 102°+, 105°+, 106°; one hour post mortem, 106.2°. The axillary temperatures were symmetrical for forty-eight hours; then, with a rectal temperature of 102.6°, temperature in the right axilla was 103.2°, while in the left it was 100.4°; and at fifteen minutes' intervals rose to 101.4° and 102.8° in the left without change in the right. At this time the left upper extremity and foot were intensely cold to the touch. Death occurred in fifty-three hours.

Lesions.—General contusion with oedema; laceration in substance of the fornix; small pial haemorrhage upon the inferior surface of the cerebellum; small haemorrhagic serous effusion in one lateral ventricle, and large serous effusion with arachnoid opacity over the occipital and posterior portion of the parietal lobes.

Case XI. *Acute.*—Primary symptoms of fractured base; temperature high from the first day; from 104°+ to 105.6° till fourth and fifth days, when it receded to 102.8° to 101°, and again rose to 104°+ to 105°+ on the sixth and seventh days; muscular twitchings of the right side of the body and left hemiplegia and hemianaesthesia on the sixth day; general convulsion beginning on the right side preceded death, which occurred on the seventh day.

Lesions.—General subarachnoid purulent effusion most copious over the left frontal lobe below the origin of the fracture.

It would seem impossible to determine *a priori* the circumstances under which an arachnitis is likely to follow meningeal injury. The alcoholic habit existed in but a minority of cases, the previous constitutional condition was often unimpaired, and the age ranged from early youth to past the middle period of life. The coexistent lesions were diverse, and had no obvious relation to the changes which the membranes had suffered. Fractures of the skull, cortical or subcortical lacerations, haemorrhages, or notable general contusions were variously discovered upon necropsic examination. Some degree of meningeal implication is probably almost invariable in intracranial injuries, but these cases fail to afford a clew to the immediate conditions which occasionally favour the development of arachnoid inflammation, The time of invasion was equally uncertain; it was in some instances immediate, and in others delayed for weeks after the reception of the injury. The interpretation of symptoms had therefore to be made without material aid from considerations of time or circumstance.

In three cases the arachnitis was primary, in another its initial symptoms were so insidious as to fail of recognition, and in the remaining seven its invasion was late and sharply defined. In the larger number, which may be considered typical, the course of symptoms referable to complicating

lesions was interrupted by a distinct and somewhat sudden elevation of temperature, accompanied by an evident change in the general condition of the patient. He became irritable, restless, delirious, or somnolent, and in one instance suffered a severe chill, though the effusion did not prove to be of purulent character. The subsequent range of temperature was erratic. It was marked by variations from day to day, or from hour to hour, not usual in other intracranial lesions. The arachnitis was so constantly associated with other grave structural alterations that it is impossible to demonstrate its exact relation to temperature, but if my observations in these few cases which were capable of verification may be supplemented with others made in recovering cases which I had reason to believe were arachnoid inflammations, I should infer that this variation was characteristic and ranged from 101°+ to 104°+. In the majority of verified fatal cases the temperature immediately before death was from 105°+ to 109°; but in each some lesion of the brain substance existed in which a very high temperature was to be expected. In one exceptional case without such complication, in which it reached 107.4°, the effusion was purulent. Whether or not these fluctuations of temperature are due to a secondary implication of thermotaxic centres situated in the cerebral cortex, as suggested by Hale White, is immaterial in a study of symptoms as related to diagnosis.

After the invasion, and aside from peculiarities of temperature, the progress of the disease was especially characterised by continued manifestations of cortical irritation. Some grade of delirium persisted in almost every case, and restlessness, irritability, or extreme sensitiveness to external impressions was often marked long after consciousness was finally lost. General or post-cervical muscular rigidity, in one instance a slight general convulsion, and in another a chill, were further indications of nervous excitation. They all, with the exception of the case of basilar inflammation, terminated within the week, and rather from asthenia than

from coma the result of pressure. The pupils were oftener normal than otherwise, and the pulse and respiration failed to reflect the existing inflammatory process; moderate acceleration of the pulse, and very slight, if any, increase in the frequency of respiration seemed to be the usual conditions. It can not be said that there was any sharp contrast in symptoms which indicated the character of the effusion. In one of the acute cases there were classical symptoms of sthenic inflammation, but there was no chill; in another, which began with a chill, the subsequent symptoms were no more pronounced than is common in the subacute form, while in the third and last, the invasion and progress of the inflammation were remarkably insidious.

The question of infection is uncertain. There was fracture of the vertex in two of the acute cases, and a scalp wound in the third; and in the case of basilar arachnitis, in which the *Streptococcus pyogenes* was discovered in a large sero-fibrinous effusion, there was a fracture through the internal auditory canal and rupture of the tympanum. There was no more than a possibility of direct infection in three out of the four; the wounds were maintained in an aseptic condition, and in the absence of an evident pyogenic process there was no proved pathogenic relation between the external lesion and the character of the internal inflammation, and no good reason to assume that it existed; if, in the fourth case, the access of the pyogenic germ is more readily comprehensible, the general history is better interpreted upon the supposition that its development was in the usual course of idiopathic secondary serous inflammation in prolonged disease, with the added predisposition derived from a previous local contusion.

I am indebted to the courtesy of Dr. H. M. Biggs for notes of eight unpublished cases of infective purulent arachnitis which were not of traumatic origin. They exhibit the same irregular fluctuations of temperature and the same varied manifestations of cortical irritation which were observed in traumatic cases of either form which I

have collated. They are of interest here as confirmatory of the proposition that the symptoms of arachnitis are not necessarily modified by its cause or grade.

It is clear from this analysis of meningeal haemorrhages and inflammations that the attempt to crystallize their symptoms with those of depressed fractures, and to formulate in a single word—compression—a resulting condition, is futile and misleading. It is no more defensible than a former practice of grouping organic diseases under the common name, dropsy. These several results of cranial injury indicate entirely different pathic conditions, and their external manifestations are more marked in their differences than in their resemblances. Even the cerebral compression which they are supposed to characteristically produce is in the majority of cases absent or replaced by a still more characteristic irritation. When it is further attempted to discriminate these artificially consolidated lesions from injuries of the brain substance by antithetical tabulations of symptoms, the possibilites of error are arithmetically increased. It is practicable from an examination of the cases which I have cited to demonstrate the unreliability, both postively and negatively, of each assumed individual diagnostic symptom in any one of the tables which are scattered through surgical text-books. The importance of a statement which I have previously made that a proper classification of morbid conditions must be based upon structural alterations, and their diagnosis established by careful analysis and comparison of resulting symptoms, is warrant for its repetition. The diagnosis of fractures, meningeal haemorrhages, and meningeal inflammations from brain lesions in the manner to which I have excepted fails in both particulars. A defective classification has been supplemented by an inaccurate analysis of symptoms, and faulty generalization has resulted in prevalent confusion.

IV. LESIONS OF THE BRAIN SUBSTANCE.

The injuries which the brain may suffer are general and local: a diffused contusion or a limited lesion, which may be either a contusion or a laceration. The analysis of cases which I have made demonstrates the exceeding frequency of visceral lesions. I have intimated the probability that some degree of general contusion always exists in intracranial injury, even though some other lesion may be paramount. At the time of my earlier observations it was only noted when its evidences were strikingly apparent, and even at a somewhat later date only when they were more than ordinarily well pronounced; yet with these limitations it will be found recorded in more than fifty per cent. of the total number of cases. Local contusions, on the contrary, have been of comparatively infrequent occurrence, while lacerations have been discovered even oftener than well-marked structural alterations of a general character. Meningeal contusion, independent of recognised visceral injury, has been encountered in but three instances, in each of which a fatal arachnitis resulted. Epidural haemorrhage, in which the effects of violence inflicted upon the cranium had not been extended to the brain, has not been once disclosed. Some implication of the brain, therefore, may be regarded as practically assured in all cases of cranial injury.

In the study of brain lesions it is necessary to determine not only the symptoms they may have in common, but if possible the existence of others characteristic of individual forms.

1. *General Contusion.*—Notwithstanding the very constant occurrence of general contusion, it so rarely terminates fatally when uncomplicated by other structural changes that opportunity for observation of its distinctive symptoms is much more limited than in cases of haemorrhages and arachnities. I am enabled, however, to present six cases in which no concomitant lesion existed, or in which, if present, it was so trivial that it may be fairly assumed to have had

no influence in the production of symptoms. In one there was absolutely nothing beyond the general contusion; in two there were also limited and non-infective dural thromboses; in another there was a single small extravasation into an optic thalamus, and in the other two there was a slight cortical laceration and correspondingly unimportant cortical haemorrhage. In all there was a more or less intense general hyperaemia, which was sometimes more strongly pronounced in some particular region, as anteriorly, posteriorly, at the base, or in one hemisphere, than elsewhere. In three cases the pia was notably engaged; in three there was well marked or even excessive general oedema; in four, thrombosis of the minute vessels, which generally characterises contusion, was a pronounced feature. I regard the last mentioned condition as a manifestation of contusion, as it is habitually absent in the hyperaemia of idiopathic disease. Punctate extravasations were less numerous than is usual in the more frequent instances in which hyperaemia is associated with laceration. In those cases in which death was long deferred, the absence of inflammatory processes was verified by microscopic examination made at the time of necropsy.

The analysis of symptoms in the six cases is unsatisfactory. The few connecting links which measurably held together the cases of haemorrhage or arachnitis have no corresponding representation. There was no uniformity either in the occurrence of individual symptoms or in their course of termination. In the single one which was absolutely uncomplicated there was no loss of consciousness at any time, till its final lapse from asthenia; in all the others it was primary and in three was permanent. There is no other individual symptom which occurred in more than half the cases cited. The pupils were dilated, contracted, or normal; the pulse and respiration were variable. It is true that delirium, mental irritability, or apathy, combined with muscular rigidity, convulsions, or some degree of paralysis, occurred in each instance save one, and in that one a profound coma

from the beginning held in abeyance all mental and motor functions; but the time of their appearance and the method of their combination had no conformity to rule. Headache, persistent vomiting, and perforating ulcer of the cornea were isolated phenomena, and in one protracted case dementia preceded death.

The temperature again probably affords the earliest indication of the intracranial condition. It was never sub-normal on admission, and was never more than moderately elevated; in four cases out of five it was from 99° to 100°; in the fifth it was 101°+, as it was in the sixth, in which it was not recorded till the second day. Its subsequent course was in general progressive, and with one exception attained a high degree before death ensued. Recessions were observed only once or twice in two cases which were considerably prolonged.

It is not difficult to comprehend the reasons for the diversity of symptoms, or for their irregular development, in view of the comprehensiveness of the lesion and its different degrees of intensity in different regions. The observation of the fact of regional variations is not limited to the comparatively few necropsies in which uncomplicated general contusion has been found to exist, but is even redundantly confirmed in the far greater number in which death has resulted from haemorrhage, arachnitis, or extensive laceration. It is not unusual in case of a contusion which involves the entire brain to find that its structural evidences are emphasised in one hemisphere or in certain lobes or in certain regions; it may be in the cortex, the basal ganglia, or elsewhere. It is not more unusual to find in a largely diffused contusion that some part, as the cortex, one hemisphere, or the cerebellum, has practically escaped. All the characteristic structural alterations are alike subject to localisations. The post-mortem inspections of the brain which I have directed have demonstrated also the instability of the parenchymatous serous exudation; this not only gravitates to dependent parts, but can be often freely expressed by the hand after

section has been made. The dropsical effusion moves through the brain substance with the same certainty, if not with the same celerity, that it does through subcutaneous cellular tissue. There is no more reason to question the fluctuation during life in the amount or position of serous transudation or in the intensity of hyperaemia originally established by violence, than there is to doubt their often progressive increase or diminution. The punctate haemorrhages into the brain substance are, of course, not subject to change, but I believe them to be less influential in the modification of symptoms than the conditions previously described.

These considerations seem sufficient to account for the wide variations noted in symptomatology. It is unnecessary to review the cases which illustrate the dependence of symptoms of cortical irritation upon cortical contusion of the vertex, or of pressure symptoms upon excessive general subcortical hyperaemia and oedema, or of various other combinations of symptoms with structural changes. It is quite possible that wider observation may furthur illumine the invasion and march of symptoms, but as these must continue to depend upon unstable conditions they are not likely even then to become fixed elements in diagnosis.

(2) *Limited Contusion.*—The distinctly limited form of contusion as distinguished from laceration demands but brief consideration. In the occasional instances in which it occurs in scattered areas through the centrum ovale it can afford no indications separable from those of a modified general lesion. In its more usual form, in which it is confined to the cortex, it differs from laceration only in the extent of local injury to tissue, and the character of the symptoms will not be further influenced by the fact that the injury is a bruise rather than a wound. It is rarely a fatal lesion, and its existence is likely to be marked by the co-existence of others of greater magnitude or severity. It has been noted in but fifteen of the necropsic examinations which I have made,

and in none of these had it appreciably contributed to the fatal result, and in but one occasioned recognisable symptoms. In the exceptional instance there had been no reason during life to suspect that there was a limited contusion rather than laceration.

(3) *Laceration.*—I have expressed a doubt whether laceration of the brain occurs without some degree of contusion. I may add that a resultant cortical haemorrhage, usually proportionate to the extent of local injury, and often sufficiently large to have an intrinsic value in the development of symptoms, is almost certain to exist as a complicating condition. I have failed to recognise one or both of these attendant lesions in but few instances, and from the time I began to record the full results of necropsic inspection, the accessory lesions as well as those which I regarded as essential, I have found the rule to be practically absolute. It is probable, however, when post-mortem indications of general injury are not pronounced, and laceration is extensive, with no more than moderate cortical haemorrhage, that the significant symptoms have been derived from the local destruction of tissue.

I have collated ten cases in which laceration has been considerable, and in which cortical haemorrhage and general contusion have been apparently insufficient to be symptomatically important. They include both cortical and subcortical injuries, variously situated upon and beneath the several surfaces of the brain, and have involved both localising and non-localising areas.

Consciousness was ordinarily lost in the beginning, though in two instances there was simple obscuration of the mental faculties, and in one consciousness was retained and the mental condition was unimpaired. Delirium very generally followed, often characterised by restlessness rather than by violence, or accompanied by fixed delusions. In one rather lengthened case there was a single delusion in which the patient never faltered, even at times when his intellectual

poise was otherwise undisturbed. The subsequent progress of the case, when death was not an early termination, was likely to be marked by evidences of mental decadence. Irritability, convulsions, loss of faecal and urinary control, were not infrequent symptoms. The pupillary condition was variable, as previously noted in haemorrhages, and, with the characters of the pulse and respiration, will be made the subject of later consideration.

The examination of temperatures is quite as instructive as in any of the conditions previously studied. In two instances the temperature was not recorded; in the eight cases remaining the record is worthy of reproduction in brief:

Case VI.—On admission, 103°; 102° in five hours, and progressive rise to 106.2° at death in twenty-four hours.

Case XX.—On admission, 101°; 104.8° in forty-eight hours and for seventy-eight hours afterward; 101°+ to 102°+ for next ensuing forty-eight hours; and 107°+ at death in seven days and seven hours. Rise progressive.

Case XXI.—On admission, 104.8°, after eighteen hours, and death in twenty-six hours.

Case XLIV.—On admission, 98°; 103.6°; 104.6°; 106.6° half hour ante mortem; death in nine hours and a half.

Case LII.—On admission, 98.6°; 104.7° in five hours; 103.8° to 103° on second and third days; 101° to 99° on fourth and fifth days; 99.8° to 101.8° till end of the twentieth day; 102.4° on the twenty-first day; 105° on the twenty-second day; 97.5° before death on the twenty-third day.

Case LIX.—On the first day, 99.8°; 104.6° on the second day; 103.6° on the third day; 103.2° on the fourth day; 107° to 108.2° on the fifth day. Death.

Case LXXIII.—On admission after twelve hours, 99.2°; 103.8°; 104° *in articulo mortis;* 106° half hour post mortem. Death in ten hours.

Case C.—On admission, thirtieth day, 100°; 104°+ to 102° from thirty-first to thirty-fourth day; progressive rise to 107.6° at death after operation on thirty-sixth day.

These temperatures call for little comment. Their remarkable primary elevation, following recovery from shock, and in early fatal cases their rapid and progressive increase, sometimes continued even after death, with in general only brief and unimportant recessions, are in such contrast to what has been observed in haemorrhages, meningeal inflammation, or even general contusions, that they are sufficiently striking phenomena to at once challenge and arrest attention. In a single instance in which in the last hours of life the temperature became subnormal, the exceptional fact is probably explicable by the asthenic condition finally induced by an advanced necrotic process.

A more comprehensive, and at the same time more accurate, conception of the symptoms due to laceration may be obtained from a review of the much larger number of cases in which limited destructive lesions are attended by other anatomical changes, perhaps equally important. It is only necessary to exclude those symptoms which have been found to be referable to each of the attendant lesions as they have occurred elsewhere in comparative isolation.

I have subjected to analysis forty-two cases of this type, in all of which the laceration has been distinctly marked, and in most of which the history and necropsic record have been fairly complete. An occasional case has been admitted to consideration in which historical detail has been lacking, but in which some characteristic symptom has been strikingly displayed. The region of the brain involved, or the nature of the complication has not been regarded.

The primary loss of consciousness which has been observed to precede the development of positive symptoms in the history of each variety of encephalic injury, and of each combination in which they have been heretofore presented, could hardly fail to characterise this series of complicated cases in which no new form of structural alteration exists. Variations in its degree or persistence, which have been noted in connection with other lesions, equally occur in the train of lacerations, whether simple or complicated.

The negative phenomena, if such a term is permissible, are indistinguishable if not identical, whatever lesion or lesions may be afterward discovered. This is readily comprehensible upon the assumption already made in case of haemorrhages, that some degree of general contusion attends all other intracranial injuries, and that to it, in conjunction with possible general shock, the immediate effect of traumatism is to be referred. If life is prolonged, the primary morbid condition will be replaced or supplemented after a variable period by the characteristic symptoms of the coexistent lesions. In cases in which consciousness has been retained from the first, as occasionally happens, the mental condition is often peculiar; it is not that of partial consciousness or of stupour, but rather of blunted perception. The patient seems lethargic, and, if sufficiently roused, apparently comprehends simple questions in a dull way and with effort; but the effort is quite likely to fall short of his making answer; he feels and sees, but scarcely thinks. From this condition he may immediately pass through somnolence or complete unconsciousness into coma and death, or he may at once regain his mental equilibrium. In a considerable number of instances, in place of this direct solution of a psychical problem, a new series of mental phenomena are interposed between the primary unconsciousness, or the condition of lethargy to which I have referred, and ultimate recovery or death.

In the previous paper upon injuries of the head, I sketched in outline certain manifestations of mental disorder which I attributed to the general class. I am convinced from further observation and more careful analysis that their significance in symptomatology should have been restricted to injuries of the parenchyma, and mainly to such of them as were of the limited and destructive variety. I spoke of these mental aberrations as of no more than "rather frequent" occurrence, but when restricted to their proper place, as indicative of the lesions which they really represent, they become more nearly pathognomonic; they

exist in some degree, or in some combination, in a very large majority of the cases which survive the initial stage. I have seen no reason to materially modify the picture I then presented. In a typical case, delirium of some grade or character follows or precedes restoration to consciousness; it may be violent and simulate the alcoholic form of mania, but oftener the patient is simply restless, excitable, incoherent, or perhaps inarticulate in speech, his mind distracted by fleeting fancies, yet amenable to control. A little later he may recognise his friends, converse intelligently and coherently, and during the day and upon cursory examination appear quite rational, though still delirious and requiring mechanical restraint at night. He has delusions, fixed or transitory, and his memory is defective or entirely wanting in regard to circumstances or occurrences which preceded his restoration to consciousness. He has perhaps no knowledge of his place of residence, occupation, or family; but whatever else he may remember or forget, he is usually absolutely oblivious of all the circumstances attending his injury, and has no apprehension of his present surroundings. His nocturnal delirium may soon disappear, and eventually, after the lapse of weeks or even months, his mind may become clear, his memory be restored, and his recovery complete. In a certain proportion of similar cases the termination is less fortunate, and some degree of permanent dementia remains. In many others, unhappily, the mental horizon never brightens after the inception of delirium, or, if at all, for a brief time only, and death is not long delayed. In another type of mental disorder, a condition of apathy or hebetude follows active delirium, and is likely to be merged in final unconsciousness. In still other cases, delirium is of a muttering character from the beginning, or from an early stage, and is accompanied by stupour. The occasional instances in which delirium, like absolute retention of consciousness, occurs as a primary condition probably concern the complication, general contusion, rather than the laceration.

It may be worth while to call attention to the frequent want of correspondence observed between the severity or mildness of the invasive psychical symptoms and the final outcome of the injury. A violent commencement has not always involved an answerable sequestration, and so, too, a good beginning has sometimes made a very bad ending; but in either instance failure to forecast the future does not necessarily imply inability to recognise pregnant symptoms. Practically the existence of the lesion has been as legibly stamped upon the histories of such cases as upon those which have run a more conventional course.

There is a peculiar irritability or sensitiveness to external impressions which I have noted as of frequent occurrence, and have ascribed to cortical injury. It is an exaggerated response to trivial irritations and disturbances which seems due less to cutaneous or muscular hyperaesthesia than to an abnormal excitability of the emotional centres. Great vexation and impatience are often manifested from slight irritation, even in the last hours of life when the patient has remained motionless and apparently unconscious for a length of time.

Aside from symptoms connected with the perceptive and intellectual centres, loss of control over the bladder and rectum is of first importance among general indications. It is impossible to estimate its numerical frequency, for if these receptacles are empty at the time the brain injury is inflicted, and if, as often happens in recorded cases, life is afterward measured by hours, or minutes even, this diagnostic point is necessarily lost. If such explicable cases are excluded, it may be said to have been very generally observed in the clinical studies of laceration which I have made, though it has sometimes failed of record. It has been equally noted in the absence of any form of paralysis, and when conciousness has been retained; and though some form of mental impairment may have always coexisted, the same loss or aberration of mental power, when due to other lesions, has not been characterised by this particular func-

tional incapacity. The lacerations have been both cortical and subcortical, and have involved all the lobes and all regions of the brain, so that the direct cause of this lack of control would seem to be any wound of the parenchyma, whether or not it may be ultimately traced to some special centre.

Convulsions have been of comparatively frequent occurrence in the fatal cases. I recall but one instance of subsequent recovery in which laceration was fairly inferential. In the fifty-two cases upon which thus far conclusions have been founded there were general convulsions in ten, convulsive movements in three, and general muscular rigidity independent of meningeal inflammation in two. This is largely in excess of the proportion of cases in which this symptom occurs in haemorrhages, of which it has been supposed to be characteristic. I have never known it to follow simple general contusion, even when of marked severity. I believe the pathic condition upon which convulsions depend to be distinguishable by certain peculiarities in their manifestation. In haemorrhages they result from compression or concomitant injury of the recognised motor area. In the thirteen cases enumerated in which they followed laceration, the seat of injury was usually in the frontal or temporo-sphenoidal lobes, or in both together; in two exceptional instances, the optic thalamus was lacerated in one, a parietal lobe was wounded by a fragment of bone in an old infected compound fracture in the other. If in some cases there were additional lacerations of other lobes, they were of secondary importance and distant from motor centres. It is obvious that when convulsions result from an intracranial haemorrhage which has relation to motor centres, they are likely to be preceded or accompanied by paralysis, as in my own cases, or in three recently reported by Dr. A. J. McCosh. If they are induced by laceration, which, as it has been shown, is in general frontal or temporo-sphenoidal, paralysis is an unlikely factor in the case. It really occurred in but two instances: once in the compound parietal lesion

mentioned, and once in a frontal necrosis surrounding a small tumor, which was only an incident in a general traumatism.

The characters of the associated symptoms—of haemorrhage on the one hand and of laceration on the other—aid much in determining the significance of a convulsion. The temperature which precedes the paroxysm has special value, since it is a very early indication of the nature of the lesion and of positive character. In every instance within my observation it has been distinctly higher than that which accompanies haemorrhage. The immediately subsequent temperature has, of course, no diagnostic importance. I have been able to discover no absolute law which governs the invasive or initial symptoms, though the first spasmodic movements are perhaps rather more frequently developed upon the opposite side.

The paralyses and anaesthesias which may follow laceration are of great assistance in fixing its location after the nature of the lesion has been established. Their very general origin, however, in haemorrhages, inflammatory effusions, or depressed fractures does not warrant the assumption from the mere fact of their existence that there has occurred a destructive lesion of the brain substance; but the laceration having been determined by other considerations, these conditions may be quite sufficient for localisation. Their connection with laceration is exemplified in many of the cases which I have described. The subject of paralysis and anaesthesia in general is sufficiently well understood to obviate the necessity of giving it any special attention in the present review of symptoms.

The irregularity of the pupils has not impressed me as of greater symptomatic importance in this than in other encephalic lesions. The forms and combinations of pupillary variation have been so numerous, and the instances in which no pupillary changes have occurred have been so frequent, that I have come to doubt the practical value of the indications which they afford. The ten cases of comparatively

uncomplicated laceration, quoted heretofore, will serve to illustrate the inconstant relation which exists between the condition of the pupils and the nature of the brain injury. In four cases there was no pupillary change, though in each one laceration was extensive, and included in one instance an excavation of an entire frontal lobe, in two others cortical destruction of both parietal lobes at the vertex, and in the fourth a considerable laceration of a frontal lobe at the base, besides subsidiary injuries of the temporo-sphenoidal and occipital lobes, the cerebellum, and a corpus striatum, variously distributed. In two cases in which both pupils were very moderately dilated there was gunshot laceration of a parietal lobe in one, and a laceration of the inferior surface of both frontal lobes in the other. In two other cases there was slight dilatation of the corresponding pupil with laceration of the frontal, parietal, and occipital lobes in the first, and of the frontal and temporo-sphenoidal lobes in the second. In a case of laceration of the lateral aspect of a whole hemisphere there was dilatation of the pupil on the opposite side. In the final case there was contraction of both pupils attending similar laceration of the lateral aspect of a hemisphere, with slight injury of the cerebellum and a general cortical haemorrhage. I am incapable of understanding how any general law is to be derived from the comparison of such data as these cases afford. The only generalisation which I have been able to make is that the pupils are more frequently normal than in cases of haemorrhage.

The high temperatures which characterised simple lacerations were maintained in the presence of complications. In the forty-two complicated cases analysed the initial observation was made immediately upon admission, but was not recorded as primary if some hours or days had elapsed after the reception of the injury; the ultimate observation was denominated final only when made nearly or quite *in articulo mortis*. Rectal temperatures only were noted.

The primary temperature was unnoted in two cases, was normal in one, and was subnormal in six; in the remaining

thirty-three it was 99° to 100° in twelve cases, 100°+ in six cases, 101°+ in ten cases, 102°+ in two cases, 103.6° in one case, 106° in one case, and 106.6° in one case.

The final temperature was 109° in one case, 108°+ in two cases, 107°+ in eight cases, 106°+ in eleven cases, 105°+ in eight cases, 104.6° in one case, and 103°+ in three cases.

In thirty cases in which the intermediate temperatures were recorded, they were in twenty progressive and without recession from the beginning to the end. In recovering cases the reduction of temperature from 99°+ to normal was very slow and often extended over several months.

These very considerable elevations of temperature have been often coincident with lesions which have involved what have been described as thermo-genetic centres, and rather noticeably that part situated about the antero inferior aspect of the corpus striatum. It is also true that laceration of any portion of the brain will be followed by a high temperature, and that the regions in which these supposed centres are situated are most subject to injury. It is therefore questionable how far the study of traumatism has confirmed in this regard the results of certain physiological investigations.

I am still unprepared to estimate the possible importance of bilateral variations in axillary temperatures. So far as my observations have yet extended the results are uncertain and often apparently inconsistent with each other, even in the same case. Temperature is sometimes uniform upon the two sides of the body, but is oftener higher upon one, which is not always the same with reference to the side of the head upon which the lesion is situated. The differences have ranged from two tenths of a degree to, in one instance, nearly three degrees. I am inclined to believe that this variation exists more uniformly in cases of intracranial injury than under other conditions, and that the temperature is rather more frequently two tenths of a degree higher upon the side opposite, than upon that corresponding to the seat

of injury. I have as yet insufficient data to form definite opinions as to its significance and pathological relations.

In eleven cases, including the one to which reference was made in the class of simple lacerations, the progressive rise of temperature was continuous for a certain time even after death; they constitute a considerable proportion of the cases in which post-mortem observation was made, and are best shown in tabular form:

Case Number.	Final temperature.	Post-mortem temperature.
25	104.8°	106°
30	106.8°	109°
33	100.4°	101.2°
34	100°	102.6°
117	107.4°	109.4°
60	108.6°	110°
61	107.8°	108°
125	107.2°	107.8°
128	106°	106.2°
73	104°	106°
130	105.6°	106°

The lesions associated with this post-mortem calescence, which extended over an hour or more, comprehended all those heretofore described, and involved all parts of the brain; the only one which was constant was laceration; but even this was sometimes disproportionate to the severity of a general hyperaemia, or to the amount of a cortical haemorrhage, by which it was attended. I am unable to trace any connection between this phenomenon and the region of the brain affected, and it certainly has no dependence upon injury of the so-called heat centres. It seems probable that it is a mere continuation of a thermogenetic process, however excited, or the result of deficient thermolysis, however occasioned.

I shall refer to the pulse and respiration in only general terms. Their one notable characteristic was a very slight deviation from the normal standard. In the whole

number of cases which I have examined, in which laceration was the essential factor and in which there was no tangible interference with the ponto-medullary region, neither the circulatory nor the respiratory function was sensibly affected until late in the progress of the case. None of the positive symptoms have been more constant in such injuries as a class than these negative conditions. If general shock was intense, as in case of some gunshot wounds, or in crushing injuries of the vertex, if haemorrhage was excessive, or if arachnitis at once supervened upon meningeal contusion, both pulse and respiration were frequent; but these cases were exceptional. The contrast habitually presented by a practically normal and unaccelerated pulse and respiration, with symptoms of perhaps great severity, seems scarcely less remarkable than the exaggerated temperatures which have been the occasion of surprise in the same series of cases. There have been comparatively few instances, either fatal or recovering, in which the pulse has exceeded ninety or the respiration twenty-six or twenty-eight in frequency; they have oftener ranged well below than above this rate. The pulse when not entirely normal has inclined to fullness and slowness. The transient stimulation and subsequent paralysis of the medulla, with corresponding retardation and acceleration of the pulse, which Von Bergmann attributed to a hypothetical functional disturbance of nutrition, has not yet come within my observation.

I have deferred until the present time the consideration of a condition of the pulse which occurs not only in connection with laceration, but with other forms of intracranial lesion, and which I believe has been only observed in my series of cases. I refer to a lack of symmetry in the radial pulsation upon opposite sides of the body. It was first noticed in May, 1893, and since then has occurred in an aggregate of twenty cases. The bilateral variation in the character of the arterial pulse consists in a difference in its fullness and strength. In some of these

instances its strength and fullness at one wrist were in startling contrast to its weakness and tenuity at the other. It was equally regular and frequent, and in all other respects symmetrical upon the two sides. In each case the existence of this difference was confirmed by two or more observers, and if not indisputable was rejected as a symptom. Eleven cases terminated fatally, of which nine were subjected to necropsy. In the recovering cases, as well as in those which were fatal but failed of necropsic inspection, the nature of the lesions was sufficiently evident from other indications. The lesions discovered in necropsy differed in each case from those in any of the others. They comprised all forms of haemorrhage, epidural, cortical, and pial; lacerations more especially of the frontal and temporosphenoidal lobes, but also of the parietal lobe and of the pons, corpora striata, and optic thalamus, and almost invariably some degree of general contusion existed. There were two cases of haemorrhage without laceration, and one of limited contusion without haemorrhage. The inferential lesions, those occurring without opportunity for necropsic inspection, were somewhat less diversified. They included four cases of depressed fracture of the vertex, with moderate general contusion in three, and with epidural haemorrhage and laceration of the frontal lobe in one; four cases of fractured base, with laceration of frontal and temporosphenoidal lobes in three, and with haemorrhage and general contusion in one; two cases of laceration of the frontal lobe, with parietal haemorrhage; and one case with simple general contusion.

The pulse was fuller and stronger on the side corresponding to the seat of injury in eight cases, upon the opposite side in nine, and in two this relation was unknown, from imperfect clinical record in one instance, and *ex necessitate rei*, in a case of general contusion, in the other.

It would seem impossible, therefore, to infer the character or location of the lesions from this symptom alone; it is equally so from any correlation which exists between it

and others by which it has been accompanied. The first few cases seemed to indicate a suggestive connection with the pupillary condition, which larger experience has shown to be fallacious. The pupils are dilated in a considerable number of cases, normal in an almost equal number, and contracted or unsymmetrical in others.

The Extent to which Traumatic Lesions Aid in the Determination of Centres of Functional Control.—The present study of intracranial lesions has been, up to this point, independent of their relation to special areas of functional activity. The question consecutively arises as to the possibility of connecting symptoms with the seat of injury in accordance with known laws of cerebral localisation. The difficulties in obtaining clinical confirmation of the inferences derived from physiological experiment, which have been recognised in the examination of idiopathic disease, are exaggerated in case of the complicated lesions of traumatic origin. The number of cases in the series which I have collated is sufficiently large to have a certain value, either positive or negative, in determining how far such a relation exists. It is conceded that a motor zone, contiguous to the Rolandic fissure in the human brain and analogous to a similar area experimentally demonstrated by comparative physiologists, has been heretofore abundantly verified by observation of both idiopathic and traumatic lesions. This is also sufficiently illustrated in the cases which I have described, though in a relatively small proportion of their whole number, since violence, even when inflicted upon the vertex, is so generally transmitted to the base, where its limited destructive effect is exerted, that the motor region is likely to escape from injury. The general and local paralyses which follow the functional or structural impairment of the motor centres are so well understood that further reference to them as they have occurred in my own cases may be properly omitted.

A much larger proportion of the cases which I have instanced relate to injuries sustained by regions of the brain

in which function has been less successfully studied in the light of clinical observation. These have presented symptoms which are, to a certain extent, diagnostic, and at the same time incidentally confirmatory of views of cerebral localisation founded upon physiological induction.

No part of the brain has been so frequently involved in fatal injury as the frontal lobes. They have been lacerated in more than one third of all the cases which I have subjected to necropsic examination. It is evident that unconsciousness or delirium attends any form of lesion situated in any region of the brain; but mental disorder or decadence, apart from these, has been supposed to be dependent upon a definite and limited structural alteration, and assumed to be of the prefrontal convolutions. The influence of direct frontal injury in so many cases upon the integrity of thought or its manifestations can hardly fail to be of assistance in determining the accuracy of this localisation.

The series of one hundred and thirty necropsies includes forty-nine instances of laceration of one or both frontal lobes. In twenty-three cases morbid mental conditions had been inappreciable through unconsciousness, which was both primary and permanent. In the remaining twenty-six mental changes were observed in nineteen. An examination of the seven cases of frontal laceration which were without mental derangement shows that one, in which early symptoms were not obtainable, involved both lobes; the other six were confined to the right side; so that, in practically every instance, every one with a history in which the left lobe was lacerated, there were evidences of mental default or aberration. The special manifestations of disordered intellect which they presented have been outlined in individual histories and scarcely require repetition in detail. Loss of memory, especially of the fact, manner, or circumstances of injury, confusion of ideas, inability of comprehension, incapacity of mental concentration, incoherence, fixed or transitory delusions, apathy, hebetude, or stupour,

were of constant occurrence, singly or in combination with each other. A condition of mental confusion and incoherence with delusions, which occurs at a late period, is often confounded with the early delirium of cortical irritation. The lacerations were not always of the same character, situation, or extent. Five had led to almost complete subcortical disintegration, eight of the cortical injuries were confined to the base, and the others, wholly or in part, were upon the antero-superior surface. In one instance the interior of both lobes was practically destroyed. The symptoms held some relation to the nature and extent of the lesion; in the subcortical excavations there was in each instance abrogation of mental power, rather than an aberration in its manifestations. The patient's condition was noted at the time in the several cases as "sluggish," "apathetic," "without sign of intelligence," or as "apparently devoid of power of comprehension." It was generally characterised by torpidity and indifference. In the cortical injuries, in place of comparative default of intelligence, there was incoherence, perverted memory with delusions, or the stupour which comes from confusion of ideas and mental indifference; the mind was alert to external impressions, though they were not always rightly comprehended. It is a noticeable fact that in a large proportion of cases the superficial injuries were upon the inferior surface, which has been classed as a latent area. The distinctions which I have made in the mental condition, as it follows cortical or extensive subcortical laceration, are broadly drawn, but I believe will be found to be justified in an examination of the cases which I have cited.

The converse proposition that frontal laceration alone of all traumatic conditions, occasions a direct loss or derangement of intellectual function, independent of delirium or unconsciousness, is only a little less absolutely true. In the same series of one hundred and thirty necropsies death had been preceded by such deficiency or derangement in four instances in which this injury was not disclosed. In

one of these, a case of gunshot wound of a parietal lobe, some slowness of comprehension was the only mental symptom aside from a hysterical melancholia which had led to a suicidal attempt; this may be properly excluded, as mental disease existed before the reception of injury. In each of the other three mental disorder and subsequent decadence were well pronounced. In one, general hyperaemia and oedema were excessive, with a small haemorrhage into the substance of an optic thalamus; in another, simple general contusion with oedema only existed; and in the third, a large localised subarachnoid serous effusion compressed the frontal lobes. The exceptional cases, but three in number, in which these lobes, though not lacerated, were still the part solely affected by a limited lesion in one and included in the general lesion in the other two, can not be said to controvert the presumptive evidence derived from physiological observation and so generally supported by the results of pathological investigation that the control of the intellectual faculties is located in this region of the brain.

The difference in the morbid mental conditions which have followed laceration, as it has affected the left frontal lobe or the right, I believe has not been suggested by physiological experiment or noted in previous observations of traumatic lesions. In every case of the present series in which consciousness was retained or regained, and in which the history was known, laceration of the left frontal lobe has been attended by intellectual aberration apart from simple delirium; in similar cases in which the right lobe has been lacerated without destructive injury of the left, there have been in their larger proportion no symptoms of mental disorder, and in the remainder there has been only stupour or active delirium, as may happen in diffused lesions and in other parts of the brain.

The examination of lacerations which involve the temporo-sphenoidal lobes has had scarcely more than a negative importance. They are forty-five in number and were

attended by an aphasic condition in but a single instance. In the greater number of cases in which laceration existed, twenty-eight, entire unconsciousness, the grave of so many possible symptoms, precluded its recognition. In the seventeen cases remaining it was confined to the base, a supposed latent area in eight, was unplaced in one, was an extensive subcortical excavation in three, and in four was situate in the lateral region, which includes the centres of speech. The instance of aphasia is detailed in the historical abstracts, and the essential lesion, which was purely lacerative, extended quite through the cortex of the first and second left temporal convolutions. The arachnoid was unruptured, and there was no cortical or other local haemorrhage; Broca's convolution was unaffected. In the other cases of lateral laceration there was slight injury of the first or second convolution. None of the forty-five cases, save the one mentioned, presented any symptom, unless it was a convulsion, which could be considered indicative of temporo-sphenoidal injury. In the sixty-two fatal lacerations which comprise all those in which the frontal and temporal lobes were implicated, separately or together, there was but the one instance of aphasia mentioned. In the recovering cases it will be found to have been of more frequent occurrence.

It has been assumed that haemorrhage compressing the centres of speech is a cause of aphasia. I am compelled to dissent from this proposition, not only as contrary to the results of my own observation, but from general anatomical and pathological considerations. The compression, if exerted by a small amount of blood, must be direct and accurately applied; if it be by a haemorrhage large enough to include these small spaces in the wide expanse of cerebral surface through which we are brought in touch with the world without, the individual default is lost in the general obscuration of all the faculties which attends the grosser injury. A pial haemorrhage from meningeal contusion in this region is likely to be scant and diffused; a cortical haemorrhage, if small and confined to either area in which the control of speech

resides, is derived from laceration of the part itself to which as the primary and more potent lesion the result must be attributed; an epidural haemorrhage while yet in moderate amount acts indirectly and inadequately upon the temporal or lower frontal region through the dura which acts as an efficient shield. In wounds of the middle meningeal artery, in which the effusion of blood may in time become excessive, the loss of consciousness which then ensues abrogates speech with all other manifestations of intellectual life, and there no longer remains a question of aphasia.

I have never met with a pial or cortical haemorrhage of local origin which suggested an interference with the integrity of speech, nor one where consciousness had been retained or restored in which blood had descended from the vertex in amount sufficient to produce this result by compression of the frontal or temporal lobe. My experience has assured me that such an event, if it happens at all, is much too unusual to justify the statement made that it is a contingency to be expected. I have seen cases of large epidural haemorrhage in which consciousness was gradually lost before death or relief by operation, but I have never recognised aphasic symptoms at any time during their progress.

There is a case of motor aphasia attributed to haemorrhage reported by Dr. M. A. Starr in which the patient was trephined with great benefit. The amount of blood was small and limited to the motor region. He immediately regained some power of speech, and a little later indicated some mental improvement. I have already expressed a belief that intellectual and emotional impairment are not occasioned by traumatic haemorrhage. There were evidences of both in this case which the amount of blood discovered and removed was certainly insufficient to explain. It is necessary to assume laceration in order to account for their existence, and it seems more than probable that the same lesion occasioned the aphasia; it might readily have escaped notice in the comparatively small opening of operation, more especially if it were entirely subcortical within the visual area. The patient,

I am told, after a lapse of years is still aphasic, a fact difficult to understand if dependent upon so small a haemorrhage as described.

It by no means follows that haemorrhage was the cause of symptoms because immediate improvement followed operation. The removal of a small portion of bone not infrequently relieves morbid cerebral conditions though the lesion remains undiscovered and unknown. Examples of successful results from operative failure in cranial surgery are as varied as the conditions which demand interference; there is one such in the present series of cases[1] in which traumatic convulsions of several days' continuance were immediately and permanently controlled by trephining both in the region of direct injury and at the supposed point of *contre-coup*, though nothing abnormal was discovered and nothing more was done.

I am unable to accept this case of aphasia as a result of haemorrhage even as an exceptional phenomenon.

There are a number of instances of laceration of the cerebellum, but they can be hardly said to have afforded distinctive symptoms. It was in each complicated by other lesions, and the indications were those of laceration and haemorrhage in general, and it might be with added localising signals of injury to areas of which the function has been more accurately defined. If the cerebellum has any concern in the maintenance of bodily equilibrium, it is not likely to be disclosed in traumatic cases.

The pons was occasionally contused; it was hyperaemic, oedematous, or in some part studded with haemorrhagic extravasations, varying from the size of a robin shot to an effusion a half by a quarter of an inch in its diameters; but resultant symptoms, if they existed, were merged in the general traumatism.

In some cases of injury of the medulla there were respiratory changes of importance, perhaps it might be better said, of interest, since they preceded death by so short an interval that there was was no longer question of prognosis or of

[1] No. 120, original series.

treatment. The constant lesion was some form of haemorrhage causing direct compression. An extension of a hyperaemia from the pons, or even of a slight oedema, seemed to be void of effect. The symptoms were those of pulmonary oedema, cyanosis, or a marked reduction in the frequency of the respiration. The first and second might be considered characteristic after exclusion of other causes of apnoea; the infrequency of respiration when progressive and extreme is almost if not quite pathognomonic. In three instances in which the respiratory acts were reduced to no more than two in the minute, radial pulsation was continued for two or three minutes after respiration had entirely ceased, as sometimes happens after mechanical occlusion of the larynx or trachea.

The more inaccessible regions of the brain are not exempt from destructive alteration. I have described cases in which the corpus striatum, the optic thalamus, the corpus callosum, the gyrus fornicatus, or a portion of the fornix was contused or lacerated, and this was sometimes the only localised injury in the midst of general contusion. There is the same insuperable difficulty in connecting symptoms with lesions of the optic thalami or corpora striata as existed in case of the cerebellum. They are not sensitive to minor injuries, and in the severer lacerations, which I have seen extend even to practical disintegration, the patient may lie motionless and unconscious with no apparent symptoms which are not afterward explained by discovered lesions of the adjacent motor or sensory areas.

I have unsuccessfully endeavoured to verify the existence of heat centres in the human brain by an examination of temperatures following intracranial traumatism, though such centres seem to have been experimentally demonstrated in the lower animals. The multiplicity of lesions, their wide extent and indefinite outline, render the results of accidental injury necessarily uncertain in comparison with the accurately limited cerebral wounds which are inflicted in vivisection. In some instances very high temperatures have attended laceration of regions which corre-

spond to the heat centres determined by experimentation. I have at times thought that this was especially true of injuries of the frontal lobe immediately anterior to the corpus striatum, but these were always included in more extended cortical ruptures or subcortical excavation, and I have observed that large lacerations elsewhere, even in parts unsuspected of special influence upon the control or production of heat, may be accompanied by temperatures equally exaggerated. The only limited injury of the corpus striatum attended by any considerable rise in temperature was small, and was complicated by a frontal laceration quite sufficient in itself to account for the thermic condition. In another case in which there was a large extravasation into the corpus striatum, three eights by a quarter inch in its diameters, temperature did not exceed 101°. In still another case the right corpus striatum was completely disintegrated and the left corpus striatum and the right optic thalamus lacerated, yet the temperature rose only to 102.2° in the eight hours and a half which preceded death. In an instance of extravasation into an optic thalamus with excessive general hyperaemia and oedema, in which the clot was as large as a cherry pit, though the final temperature was 105°+, there was no elevation above 100° till the fifteenth day. Lacerations of the fornix and corpus callosum were followed by much higher temperatures. Laceration of the pons in one case developed an excessively high temperature, but in others there was no unusual elevation. Cortical centres, as they have been described, are topographically too indefinite to afford data for accurate comparison of cases. I believe, however, that the highest temperatures which I have recorded have not corresponded to injuries of tissue in what I understand to be their situation. Lacerations of any part of the cortex have been attended by marked elevations of temperature, quite as great when at the base as when in the uncertain neighbourhood of the "cruciate centres."

The opinion which I have formed from an analysis of

my first series of cases that high elevations of temperature from traumatic laceration of the brain were dependent upon general nutritive changes rather than upon lesion of limited thermogenetic or thermotaxic centres has not been disproved or modified by subsequent experience. It is impossible to predict the result of further clinical observation, but Dr. C. L. Dana's examination of intracranial haemorrhages of idiopathic origin, in which he reaches the same conclusion, tends to confirm my belief in the correctness of my original impression.

I have been equally unable to connect the occurrence of certain circulatory phenomena with lesion of definitely limited vaso-motor centres of control. The lack of symmetry in the characters of arterial pulsation upon opposite sides of the body, which has been frequent, and the dark flush upon the face which I have noted in two cases of very different import, are to me as yet aetiologically and pathologically inexplicable.

The results of a general analysis of all the cases which I have recorded up to the present time, so far as they relate to functional localisation, may be summarised in the following propositions:

1. That the control of the intellectual faculties resides in the frontal lobes, perhaps exclusively in the left, and that manifestations of their aberration or default are due to a destructive alteration which is almost invariably laceration.

2. That the control of the faculty of speech, resident in the frontal and temporal lobes, is impaired by structural alteration alone.

3. That characteristic disturbances of respiration are caused only by compression of the medulla from haemorrhage.

4. That high elevations of temperature, while dependent in occasional instances upon diffused contusion of the brain substance, are ordinarily the result of limited lesions

which are confined to no special regions or centres of control.

(4) *Pyogenic Parenchymatous Inflammation.*—There remains a parenchymatous inflammation of pyogenic character. It is an infrequent result of traumatism, and is of limited form except when produced by the intrusion of a foreign body, as of a bullet or drainage-tube. I exclude cases of infection from direct laceration which sometimes follow neglected compound fracture with wound of the dura. They are surgically unpardonable, and at the present time ordinarily due to the stupidity of the laity rather than to the carelessness of the surgeon. They afford no question of diagnosis, since the pyogenic process alike involves the brain, the membranes, and the surface of the wound, and is open to visual inspection. The few cases which have been admitted to my service were recognised without difficulty.

The infrequency of central or true abscess as a result of traumatism is confirmed by my experience, in which it has occurred but twice in a series of three hundred cases—once in the fronto-parietal and once in the parieto-occipital region beneath the angular gyrus; in both it succeeded a compound depressed fracture of the vertex without wound of the dura, and was situated at an appreciable distance from the point of cranial injury. In the first case, after elevation of the bone and some primary rise in temperature, there were no general symptoms till the twentieth day, when a few drops of pus escaped from the wound and a cavity was discovered two inches and more away from the opening in the skull. At this time there was a little mental dulness and slight facial paralysis with a scarcely noticeable elevation of temperature; recovery soon followed. In the second case the wound healed, and there were few indications of trouble beyond those dependent upon some enlargement of the cervical glands till the twenty-second day, when the patient somewhat suddenly began to suffer from acute frontal headache, became delirious, somnolent, hemiplegic, and within twenty-four hours

hemianaesthetic, with unconscious and involuntary evacuations, and with infrequent pulse and absolutely normal temperature. The abscess, which was small, was discovered and drained, but death ensued sixteen hours after operation. Both cases conform to the dictum of Von Bergmann that no traumatic abscess occurs without wound of the integument, and are not inconsistent with the bacteriological opinion that parenchymatous inflammation of the brain is always septic. Von Bergmann, however, is in error in his general proposition. In a circumstantial report of the second of the cases mentioned, I referred to a specimen in the collection of Dr. H. M. Biggs which in connection with its history affords conclusive evidence that an "open wound in the head or soft walls of the cranium" is not essential to the formation of a traumatic abscess. In this case a youth of seventeen was struck in the forehead by a baseball and suffered temporary unconsciousness; there was neither cranial fracture nor wound of the scalp, and in two or three days he had apparently recovered, though headache persisted. Later there was impairment of vision and eventually total blindness. His death occurred suddenly about six months after the reception of the injury. The abscess occupied the whole left frontal lobe, encroaching upon the parietal, displaced the tentorium backward, and compressed the right hemisphere. It is unnecessary to multiply instances, as a single one is sufficient to show that a possible general rule is not to be regarded as absolute. The distinction is important in diagnosis, for in a large class of cases it prevents the exclusion of a condition which always must be reckoned with as a possibility at least. I have no doubt that the external cephalic wound usually exists, and that as the shortest route by which the pyogenic germ can travel, it is the one by which entrance to the brain is likely to be expected.

In the report to which I have referred I attributed the location of the abscess to a limited subcortical contusion and, as I think, demonstrated the correctness of my conclu-

sion. Von Bergmann again errs in making a statement too positive when he denies the existence of this lesion except as a product of extreme violence, which "shatters the entire skull." Bruises and lacerated wounds of the brain are demonstrably very much more frequently superficial than subcortical, but instances both of laceration and of areas of limited contusion in its deeper structure, when no extraordinary violence has been inflicted, have been often enough disclosed in this series of cases to make it evident that if infrequent they are hardly to be considered unusual. It is rather the surface abscess, which he believes to exemplify the rule, than the central contusion and abscess which is to be considered exceptional. Pott's puffy tumor, the surface abscess, and even hernia cerebri as a factor of importance, have practically disappeared from the field of American if not of German surgery. In fact, any form of traumatic brain abscess is so exceptional that it seems idle to speak of either rules or exceptions.

The immediate cause of the pyogenic process is a question which so exclusively concerns the bacteriologist that I shall not venture to enter upon its discussion. Dr. Biggs, who commands my confidence, regards all pyogenic processes in the brain substance as of septic origin, and since the colon bacillus has been found in the product of idiopathic arachnoid inflammation I am quite prepared to believe that the streptococcus or any other germ can in some way reach the nidus formed by the bruising of the parenchyma, even though a direct route has not been opened through a cranial wound.

It is, of course, impossible to discuss symptomatology or diagnosis upon a basis of observation derived from two cases, and this study of intracranial lesions in their traumatic aspect has been confined to the results of personal experience. I call attention only to the possible relation of acute posterior cervical glandular enlargement, which occurred in the second case, to the beginning of cerebral inflammation.

The term encephalitis has been rather freely used to

express a supposed result of intracranial injury. I believe that in the proper sense of the word no such condition exists. In case of any infected cranial wound pyogenic inflammation may extend through the meninges and include the cortex, or a diffuse purulent inflammation of a portion of the parenchyma may even reach the meninges, and in any acute arachnitis the contiguous brain surface may be infiltrated with cells; but anything like a concurrent general inflammation of all the cranial contents is unknown to me either from observation or from definite record. It is often held to be synonymous with cerebritis, which as a general parenchymatous inflammation, independent of the pyogenic process which I have mentioned, I regard as no less apocryphal. I have procured the minute structural examination of many hyperaemic and oedematous brains taken from patients who had survived injury for some days or weeks, but in no instance has any evidence of the inflammatory state been discovered. This result is in accordance with the opinion of Dr. Biggs which I have already quoted. I have read numerous vague descriptions of traumatic encephalitis or cerebritis, but none in which the disease was fitted to the name, or in which it was connected with precise pathological changes. I am too well aware of the danger of unqualified statements to deny absolutely that it ever exists; but, so far as I am enabled to judge, it is no more than a misapplication of words or pure assumption.

CASES NOT VERIFIED BY NECROPSY.

It seems proper at the conclusion of a summary of cases in which the value of symptoms has been established by necropsy to refer to those which by reason of recovery have been heretofore disregarded as incapable of affording positive evidence of the pathogenic condition upon which they depend. I believe no differences in symptomatology will be found to exist except in degree, and in many instances the early progress of the case is not at all indicative of the final result. There is probably no symptom which occurs in

fatal cases which may not be noted in those destined to a more favorable termination, except the infrequency of respiration which follows compression of the medulla; and no other symptom which is less characteristically present, except elevation of temperature. Even in temperature the distinction is not absolute; it does not apply in cases of haemorrhage, and only to the later stage of meningeal inflammations and of the morbid conditions occasioned by lesions of the parenchyma. Not only in the beginning but for a considerable time afterward temperature may rise absolutely higher in a recovering case than at any time in the course of one which is to end in death; but in general it is less pronounced. I have never known it to exceed 105°, and rarely to attain so great an elevation. The symptoms altogether exhibit no greater differences, as the issue varies, than obtain in other types of disease.

In illustration of the cases in which the significance of symptoms has not been demonstrated by the direct inspection of pathogenic lesion, I have abstracted the histories of a certain number, of which some ended in recovery and others in death, but without necropsy. This class includes one hundred and four as yet unpublished cases, in addition to the sixty-six which appeared in my first series. Many of these are fractures of the base or vertex, or uncomplicated general contusions in which symptomatology, diagnosis, and results were so simple that they have scarcely more than a statistical value. I have selected from the remainder some which have special interest on account of symptoms which made diagnosis clear, or which occurred in such combination as to make their interpretation difficult.

Case I.—Male, aged thirty-five years, fell while dancing and struck the back of his head on the ballroom floor; no loss of consciousness, and no other indication of injury till thirty minutes afterward, when the right upper eyelid began to droop. On examination five hours later, symptoms were confined to right eye and appendages; complete ptosis, external strabismus, paresis of all the ocular muscles, imperfect accommodation, and diplopia; normal pupil and retina. At the end of eigh-

teen months there was still some weakness of the ocular muscles, but no ptosis. The right pupil was permanently dilated.

Case II.—Male, aged twenty-eight years, received a contusion of the right parietal region, and on the second day began to exhibit symptoms which were observed at the time of examination, ten days later; wide dilatation of left pupil; incomplete paralysis of all the ocular muscles and of the elevator of the upper lid of the left eye; anaesthesia of the left conjunctiva and of the mucous membrane of the left nostril, with loss of smell on that side; and intense and constant pain in all the parts included in the distribution of the fifth cranial nerve on the left side. No paralysis of the facial muscles. Some numbness of the left upper extremity. No other symptoms. Ophthalmic examination by Dr. Callan disclosed some cloudiness of the fundus and enlargement of its veins in both eyes; accommodation very imperfect. Subsequent loss of hearing in left ear; case still under observation.

Case III.—Male, aged forty years, fell from a truck and struck upon his head; partial loss of consciousness; profuse haemorrhage from right ear; wide dilatation of left pupil; temperature, 99.8°; pulse, 92, and respiration, 23. Second day: slight delirium; mental stupour; no response to questions; temperature, 100.8°. Third day: severe general convulsion, beginning in left arm and hand; both pupils afterward widely dilated; temperature, 100.2° to 100.6°. Fourth day: similar convulsion, but less severe; temperature, 99.8° to 100°. Eighth day: mind clear, but torpid; no recollection of an accident having occurred; speech slow and somewhat aphasic; headache and continued dilatation of pupils. Twelfth day: mental condition normal; temperature, 99°+. Discharged without further symptoms on the twenty-ninth day.

Case IV.—Male, aged sixty-five years, fell thirty feet; consciousness lost, and regained twenty hours after admission to the Presbyterian hospital; left hemiplegia; temperature, 98°, which fell in four hours to 97°; pulse, 70 to 80; normal pupils; lacerated wound of scalp. Transferred to Bellevue hospital eighty-two hours after reception of the injury. There was then delirium with delusions; restlessness; no recognition of changed surroundings; normal pupils and respiration; no paralysis; temperature was 100.5°; pulse, 112. For ten days continued restlessness, and at times delirium, with lack of urinary control; temperature, 102.6°; pulse and respiration moderately accelerated. After that time mental condition became normal, at first only during the day, and all symptoms disappeared. Seventeen months afterward mental and physical condition unimpaired.

Case V.—Male, aged fifty-five years, fell unconscious in the street. On admission, profound shock and entire unconsciousness; wound of scalp in right posterior parietal region; free haemorrhage from right ear, and uniform contraction of pupils. One hour later, rigidity of left

arm, and, to a less extent, of left leg. Consciousness restored in twenty-four hours, and a little later the pupils became normal and the mind clear. Temperature on admission, 98°, declined to 97.4°, and rose in twenty-four hours to 99.4°; pulse and respiration normal. On the third day, temperature, 99.6°, and only psychic symptoms; mental processes a little less slow than on the previous day, but memory defective. No recollection of anything which happened after leaving home in the early morning, some hours previous to the accident; memory of words and facts equally deficient. Upon questioning, the patient said that he lived at "No. 4 in the Ninth Ward"; then remembered that it was opposite a school, which he called "skull," and finally that it was in Grove street. On the following day he had again forgotten the name of the street, and its mention awakened no remembrance; he misplaced many words, and could not be brought to recognize his errors. A week later he had much general headache, realized that his mind had been greatly confused, and was still ignorant of all that had happened since leaving his house. He was discharged on the eighteenth day, his temperature and mental condition having been normal for several days.

Case VI.—Male, aged forty-five years, thrown from a truck in collision; admitted in shock and still unconscious; pupils contracted; temperature, 97.5°; pulse, 52; respiration, 18; twelve hours later, temperature, 97.5°; pulse, 50; respiration, 12; in fourteen hours, consciousness restored; temperature, 98°. Second day, no recollection of injury, previous occupation, or married condition. Third day, ecchymosis over right mastoid process and extending upon the back of the ear, not previously apparent. Fourth day, the patient, after much questioning and trouble, was enabled to remember his residence and occupation; temperature, 102°. During the rest of the week his temperature declined and mental condition improved, though he was still irrational, and at night required mechanical restraint. In the second week he was rational at times; he was capable of expressing the generalization that a man's mind is clearer by day than at night, and described correctly the manner in which he received his hurt, though he again forgot the circumstances and denied that he had said anything about it; he was irritable and forgetful, even of the outrage to which he considered himself subjected in the taking of his temperatures; he had delusions, saw imaginary persons, and heard unreal voices, made contradictory statements about the injury which he had suffered, and was much annoyed at the attempts which were made to get from him some coherent and consistent history. Early in the third week his temperature became normal, his memory and other mental faculties were restored, and he was discharged from the hospital.

Case VII.—Male, aged forty-five years, mind impaired by alcoholic excess, fell one flight of stairs; consciousness retained, haematoma in left temporal region, profuse haemorrhage from left ear, and slight epistaxis. Temperature, 98°; pulse, 90; respiration, 24. Second day,

a little delirium, rigidity of both arms, and left facial paralysis, both upper and lower; temperature, 100.2°; pulse, 100; respiration, 24. Incision made through haematoma revealed linear fracture of left squamous portion extending into the base. In the three days following, the temperature and mental condition became normal and facial paralysis nearly disappeared. Two days later temperature rose to 100.5°, facial paralysis increased, left side of face and neck became swollen, and delirium supervened. From this time there were recurrent maniacal attacks, lasting less than twenty-four hours, in one of which he was transferred to Bellevue hospital and soon afterward escaped. He was, at a subsequent period, sent to an asylum for the insane, and is now, after sixteen months, at home, but of recognized unsound mind.

Case VIII.—Male, aged thirty-eight years, fell from a second-story window; unconscious and delirious on immediate admission, and in same condition when transferred from alcoholic ward to surgical service next day. Compound depressed fracture of left temporal bone, extending into the occiput between the curved lines; irregular dilatation of the pupils; internal strabismus of left eye which was afterward found to be congenital; pulse slow and full; breathing stertorous; no control of urine and faeces. The bone was elevated, and an epidural clot, which extended only toward the base, was removed as far as practicable; no discoverable dural or subdural lesion. Third day, left radial pulse fuller and stronger than the right; partial left lower facial paralysis and dysphagia. Fourth day, violent delirium. Fifth day, dysphagia and cessation of bilateral variation in radial pulse; delirium continued, with a short interval in which it intermitted. The symptoms were variable until the end of the fourth week; delirium of different grades at different times alternated with periods of quietude and rational intelligence; various delusions were more or less persistent; dysphagia, lack of urinary and faecal control, and facial paralysis still continued. After this time mental improvement was progressive, and in the seventh week the mind was entirely clear. At the end of eight weeks recovery was complete, and twenty pounds lost in weight had been regained. The temperature on admission was 97.6°, on the second day, 102°, and after operation, 104.4°; it subsequently declined to normal at the end of the second week, and afterward varied from normal to 99°+. The pulse and respiration were varied, but never frequent. At the end of fifteen months he suffers no mental impairment.

Case IX.—Male, aged thirty-one years; fell two stories upon an iron beam; unconscious and delirious on immediate admission; wound above the left eye and contusion of the left shoulder; loss of urinary and faecal control, which was not regained. Subsequently the patient was usually delirious at night and stupid during the day, and without other general symptoms; he was only once or twice able to make coherent reply to a question asked. He died in profound coma at the end of twelve days.

Temperature on admission was 99°, rose gradually to 105° on the ninth day, and was 104.8° just before death. The pulse was 82 on admission and the respiration 24, and both afterward varied each day from moderate to extreme frequency.

Case X.—Male, aged thirty-one years; was struck by a brick which had fallen five stories; no other immediate general symptom but unconsciousness. A compound depressed fracture crossed the median line at the vertex. Second day: There was accurate memory of events up to time of injury, no recollection of anything that occurred afterward. Third day: Fragments of depressed bone were removed, leaving an opening in the skull two inches by an inch and a half in its diameters; no lesion of dura or of the sinus. Temperature on admission 104.4°, at time of operation 100°, subsequently 99°+. Pulse and respiration at all times normal.

Case XI.—Male, aged thirty-two years; fell from his truck and struck the pavement upon the back of his head; partial loss of consciousness and delirium which continued for three days. Fourth day: Limited power of comprehension, no response to questions asked, attention fixed only with difficulty, occipital headache which was not increased by pressure or percussion, and somnolence. At the end of four weeks the patient sat up, but walked with difficulty on account of imperfect muscular coördination in both legs; patellar reflexes normal; mind clear but slow in action, which he himself noted; vertigo, which was not of previous occurrence; occipital headache relieved. Dr. P. A. Callan discovered upon ocular examination a neuritis, more advanced upon the right side than upon the left, and a paralysis of the ocular muscles. Temperature on admission was 99°, rose to 100.4° on the same day, was from 99° to 101° till the sixth day, 98.5° to 99°+ till the twenty-first day, and afterward continuously normal. The pulse was normal. The respiration was 12 for three days, 16 to 18 for six days, 8 to 12 for thirteen days, and afterward 16 to 20.

Case XII.—Male, aged thirty-five years; fell one story; brief unconsciousness followed at once by delirium; extensive lacerated wound in left parietal region; haemorrhage from left ear caused by wounds of external meatus. Temperature on admission, 101.5°; pulse, 80; respiration, 18. Delirium continued three weeks, gradually diminishing in degree and constancy; no subsequent recollection of the manner of injury. Loss of urinary control lasted one week; no headache at any time, and no later symptoms. Patient recognised his family and surroundings after three or four days.

Case XIII.—Female, aged five years; struck by a falling box which seemed to have crushed her head laterally against the floor. Still unconscious at time of admission, but very sensitive to external irritations; slight twitching of right side of the face, slight epistaxis, slightly accelerated respiration, slow and irregular pulse; temperature, 95°; pupils

sometimes normal, sometimes widely dilated, with conjugate deviation which was sometimes upward and sometimes to the left; vomiting soon after reception of the injury; haematoma over entire vertex, and contusion of both eyes. Incision disclosed fissures on either side of the calvarium; one extended from the left temporal fossa posteriorly across the vertex to the right occipital region, and anteriorly into the anterior fossa; another, apparently beginning in the right anterior fossa, crossed the right parietal bone and terminated in the first. The bone was depressed posteriorly and the fissure open; after elevation and removal of some small fragments considerable epidural haemorrhage was apparent. Consciousness was fully restored within twenty-four hours, and was marked by restlessness and delirium, which continued for two or three days, after which the mental condition was normal. On the fifth day paraplegia occurred, which was almost complete from the first, and absolute on the next day, with partial anaesthesia; no paralysis of the bladder or rectum. The paraplegic condition began to improve at the end of a week's time, but very slowly; a few steps could be taken without assistance six weeks later. The temperature soon after admission rose from 95° to 98.5°, on the next day to 100.2°, and after the third day varied from 98.4° to 99.8° usually normal in the morning. The respiration was accelerated for the first ten days, and the pulse frequent for three days.

Case XIV.—Female, aged thirty years; was thrown from a wagon while driving, striking the back of her head upon an asphalt pavement; shock, loss of consciousness for twenty minutes, and severe vomiting, which persisted during the day; temperature, 100°; not taken afterward; haematoma in right occipital region, and ecchymosis behind the right ear, followed by severe localised pain in the right side of the head posteriorly. The later symptoms were a muffled feeling in the right ear, with diminished hearing and blunted perceptions of taste and smell which had been noted from the time of accident. The disorders of hearing did not continue after the fourth week, but the senses of taste and smell have been permanently impaired.

Case XV.—Male, aged thirty-three years, struck on the head with a hammer and was momentarily unconscious, after which he walked to the hospital. Compound depressed fracture of the mid-vertex; both pupils dilated; left radial pulse markedly fuller and stronger than the right till after operation, five days later; no other general symptoms. Depressed fragments of bone were removed, leaving an opening in the skull an inch and a half by one inch in its diameters; haemorrhage from a large wound of the longitudinal sinus controlled by gauze packing. Pulse and respiration became normal on the following day, and radial pulsations symmetrical on the third day. Elevation of temperature was maintained by a slough and inflammatory conditions produced by an accidental burn. Temperature on admission was 99.2°, rose in a few hours to 101.4°, and after the operation to 102°+; pulse and respiration, normal at first, were subsequently only moderately accelerated.

Case XVI.—Male, aged thirty years; fell twenty-five feet from a ship's deck to a raft alongside; consciousness lost for a few moments only; haematoma over right posterior parietal region; moderate contraction of the left pupil; right radial pulse fuller than the left; urine retained; complete paralysis of left lower extremity; nearly complete paralysis of the left arm; partial paralysis of the right upper extremity; anaesthesia of the right side of the body below the third rib; hyperaesthesia of the left lower extremity; great pain and tenderness in cervico-dorsal region, and evident fracture of the first dorsal spine; mental condition apparently normal.

During the first week vomiting occurred at least once in each twenty-four hours, and pain in the frontal and in the upper dorsal region was constant and severe. The bilateral variation of the pulse was distinct till the fifth day. The paresis, hyperaesthesia, and anaesthesia, and the contraction of the left pupil persisted in greater or less degree for several months, and a paresis of the left lower extremity and the anaesthetic and hyperaesthetic conditions and the contracted pupil existed at the time of final discharge from the hospital.

An ophthalmic examination was made by Dr. Callan, and repeated at a later period, with negative result. The eye was retracted and a little less sensitive than the other, but there was no retinal change, and no loss of power in the ocular muscles.

There was no mental disturbance till the occurrence of nocturnal delirium and restlessness at the beginning of the third week. A few days later the nocturnal delirium ceased, but the restlessness at night increased, and delusions of a painful character began to occur, which occasioned the patient much distress. The first trouble which came to him was the fancied death of his wife, and when, a little later, he became convinced that this bereavement was imaginary, he was equally positive that another delusion, the death of his child, was real, and this new conceit possessed his mind for many weeks. He suffered acute mental anguish in each instance, which could have been scarce exceeded had these pure fancies been actual facts. The facial expression grew a little stupid, and an inclination to weep was manifested on ordinary occasions, equally when the amount of cutaneous hyperaesthesia was tested, or when discourse turned upon his family afflictions, but speech was always coherent. At the end of the second month there was some improvement; the facial expression brightened, delusions were less constant and of a more trivial character, and the mental condition was less uniformly clouded. In the third month delusions altogether disappeared, and mental processes, though slow, were no longer distorted; he was enabled for the first time to recall the manner of his injury; vertigo, which had been an early symptom, still persisted.

The temperature on admission was 98.4°, rose during the day to 101.8°, and on the fifth day reached 105°. It was habitually high till late in the second month at some time in each twenty-four hours, not less than 101°+ to 102°+, the diurnal variations being also considerable. The left axillary temperature was markedly higher than the right, usually

five tenths of a degree or even more. The pulse was ordinarily from 80 to 90, occasionally 60 to 70, and rarely exceeded 100. The respiration during the first month was not often less than 30, and later ranged from 28 to 24.

The patient left the hospital seven months after admission. There was then no trace remaining of the cerebral injury beyond a little heaviness of manner and a little slowness of thought. The persistence of the spinal lesion was indicated by a stationary paresis of the left lower extremity and by a continuance of the disorders of sensation which immediately followed the traumatism. The left eye was still retracted and insensitive and its pupil small.

Case XVII.—Male, aged thirty-six years; fell ten feet from a vessel to a raft alongside and then into the water; brief period of unconsciousness, profuse haemorrhage from left ear, slight epistaxis from left nostril, and haematoma in left mastoid region; single general convulsion in the ambulance followed by stertor; consciousness regained at time of admission; both pupils widely dilated; haemorrhage from the ear recurred during the night; urine retained; temperature, 98.8°. Frontal headache continued for several days, and on the third day there was transient photophobia with contracted pupils. The bladder and rectum were controlled. Dilatation of the pupils was perceptible till the end of the second week, and of the right pupil even longer. The prominent symptoms were mental; nocturnal restlessness and delirium, and a rather stupid condition during the day, were succeeded in the second week by continued delirium of a mild type with delusions. In the third week active delirium ceased, though restlessness at night persisted; the facial expression was more intelligent, and speech was coherent; there was perfect recollection of the manner in which the injury had been received, and also of a similar accident which had occurred on the same day and aboard the same ship (Case XVI immediately preceding), but delusions were numerous and constant. At the beginning of the fourth week the patient was restless, excitable, talkative, and had again forgotten the manner and even fact of his injury. Ophthalmic examination was made by Dr. Callan with negative result. At the end of the fourth week delusions finally ceased, and when discharged from the hospital in the eighth week there were no symptoms remaining. The sense of smell was entirely lost.

The maximum temperature was on the fourteenth day, from 101° to 102.2°; the usual temperature was 99°+ till after the fourth week, and then varied from normal to 99°. The axillary temperatures were observed from the fourth to the eighth week; the left was habitually, but irregularly, higher than the right. The pulse and respiration presented no notable changes.

Case XVIII.—Female, aged seventeen years; fell from second-floor window; found in coma with profuse haemorrhage from left ear and some haemorrhage from the mouth; left side of face, eye, and parietal

region much contused. Two hours later consciousness was partially restored and sensitiveness to external impressions recovered; haematemesis occurred, and at a later period, after subsidence of ecchymosis of the lids, sub-conjunctival haemorrhage in the left eye was discovered; the right pupil was dilated. Six hours after admission, temperature, 97.4°; pulse, 70; respiration, 38; lack of urinary control. The haemorrhage from the left ear continued for thirty-six hours, and was followed by a discharge of bloody serum. During the first three or four days the patient was at times noisy and restless and at times quiet. She then became rational and learned for the first time that she had met with an accident, and was in a hospital; but she never knew, then or afterward, of her own recollection what had happened to her. At about the same time a protrusion of the left eye became marked, and it was discovered that vision was lost on that side. There were no additional symptoms. The temperature on the second day was 100.2°; pulse, 68; respiration, 18; and temperature afterward varied from 99° to 100°+.

At the end of the fourth week ophthalmic examination was made by Dr. Callan. The right eye was in all respects normal. The left eye was on a slightly anterior plane to that of the right; its movements were unimpaired; there was a slight remaining trace of haemorrhage near the limbus corneae; the pupil was moderately dilated and not responsive to direct rays of light, but acting consensually with the right; there was commencing atrophy of the optic nerve and total loss of vision. From the clinical history Dr. Callan was of opinion that a line of fracture had implicated the left optic foramen.

Case XIX.—Male, aged forty years; found in the street in an alcoholic condition: could walk with assistance; profuse haemorrhage from left ear; slight oedema of scalp in left occipital region; no general symptoms. The recollection of having been brought to the hospital and of previous wanderings, but not of the manner of injury, returned with sobriety. Ecchymosis of both lids of right eye appeared on the following day; vertigo and occipital headache and some pain behind the left ear existed for ten days. Temperature on admission, 98.4°; rose to 101° in the course of eighteen hours, and was afterward 99° to 100°+ during the three weeks the patient remained under observation. The axillary temperatures were usually symmetrical, and when any difference was noted it was higher on the left side. The pulse more frequently exceeded 90 or 100 than is usual in similar cases. The respiration was normal.

Case XX.—Male, aged nine years; fell ten feet from a dump into a scow; consciousness lost for fifteen minutes; no external injury; temperature, 98.2°; pulse, 67; respiration, 28. Third to fifth days, right radial pulse fuller and stronger than the left; somnolence till seventh day, and recurrence on the tenth and eleventh days with a condition of mental indifference; occipital pain continued at intervals during ten days. The temperature five hours after admission was 100.2°, in twelve hours was 101°, and did not exceed that degree; it was 99°+ to 100°+

for fourteen days, with an occasional decline to normal for a single observation or for a few hours. The axillary temperatures were observed four times daily, and the left was habitually six tenths of a degree or more higher than the right, and sometimes the difference was as great as 1.8°; they were occasionally symmetrical, but in sixty-eight observations the right was never the higher. The pulse was usually 52 to 84, and more frequently approximated the lower figure. The respiration was from 18 to 28.

Case XXI.—Male, aged fifty years; fell twelve to fifteen feet from a loft and struck upon the back of his head, six hours previous to admission; unconscious fifteen minutes; contusion of the vertex in the median line; wound in right occipito-mastoid region; haemorrhage from right ear; delirium from time consciousness was restored, often requiring mechanical restraint; dilated pupils, and right radial pulse fuller and stronger than the left; the urine was retained and the right hand and wrist were paretic. There was marked aphasia—*e. g.*, the patient said "talp that" for stop that, "guth Got" for good God, and "15 Avenue B" when asked his name. The difference in the fullness and strength of the radial pulses continued to be strongly marked at all times till death on the eighteenth day. The dilatation of the pupils, which remained sensitive till the seventeenth day, was also permanent. Delirium persisted, and speech was infrequent and unintelligible till the close of the first week; the mental condition then became brighter and speech distinct and coherent, but delusions were constant and the patient was at no time able to recognize his family or friends. There were subsequent alternations of restlessness and excitability with somnolence or lethargy, but no cessation of delirium, delusions, and more or less incoherent and unintelligible speech, till final unconsciousness, which occurred three days before death. Sensitiveness to external irritations was marked throughout this later stage. The control of urine and faeces was permanently lost during the first few days. The paresis of the right hand was much diminished during the first week. On the sixth day, and on the seventh, there was a short, severe, convulsive attack, followed by a transient high temperature. These were succeeded on the morning of the eleventh day by a general convulsion, which was at first confined to the upper extremities, and continued twenty minutes; the right arm was less rigid than the left. Another attack in the afternoon of the same day, of twenty-five minutes' duration, began with a twitching of the facial muscles, and was extended to the trunk; all the extremities remained rigid; the face was of a natural colour, though subsequently much flushed, but the hands were blue. The morning convulsion was followed by prolonged unconsciousness, that of the afternoon by an apparently natural sleep after a short interval in which the mind was unusually clear and alert. There was another very brief general convulsion five days later. Posterior cervical muscular rigidity existed from the ninth to the fourteenth days. The temperature on admission was 101.8°, and varied from 100°+ to 101°+

till the fourth day, when, without other change in symptoms, it rose to 104°; and in the twelve hours following declined to 101°+, and was continuous at about that degree till the tenth day, except at the time of the first and second convulsive attacks, when it rose for a short time to 106° and 106.6°; on the morning of the tenth day it rose to 105°, again declined to 101°, and with the occurrence of the third and fourth paroxysms on the eleventh day it rose to 105.4°; on the twelfth day it declined for a brief interval to normal, and was subsequently uniformly high, from 103° to 106°, and at death was 108°. In fifty-two observations the right axillary temperature was higher than the left in thirty-two, the left higher than the right in seven, and in thirteen the two were uniform; the variation was from 2.10° to 1.8°. The pulse on admission was 112, and then, for the first ten days, 65 to 100; never afterward below 120. The respiration on admission was 36, and after the first four days rarely below 32.

Case XXII.—Male, aged forty-two years, fell in the street, striking the back of his head; consciousness lost, but regained on the way to the hospital; mental condition stupid, but rational, becoming normal in a few hours; slight general headache; later, frontal pain, followed same day by a single general convulsion of five minutes' duration; head and eyes turned to the right; left side and extremities actively convulsed; right arm and leg motionless. On the third day there was transient posterior cervical rigidity, and on the third and fourth days the left radial pulse was fuller and stronger than the right. During the first ten days the patient's condition was marked by stupour, occasional somnolence, slowness or refusal to answer when questioned, nocturnal delirium becoming continuous, frontal pains, and contracted pupils. In the week following there were delusions, lack of faecal and urinary control, increased somnolence and stupour, some muttering, delirium, and pains in the back of the head and left extremities, succeeded by left paresis. After this time the patient occasionally indicated more intelligence when roused from his habitual stupour, and once conversed intelligently with his wife. The pupils remained contracted and insensitive to light, the urine and faeces uncontrolled, the limbs drawn upward, and any disturbance of the left side of the body was resented. On the twenty-fifth, the last day of life, articulation was indistinct, deglutition difficult, and death, preceded by restlessness and some brightening of the mental condition. The temperature on admission was 98°, rose to 103.2° on the third day, and was subsequently 99° to 100°+ till the last day, when it was 107.2°. The pulse on admission was 80, on the fifth day, 42 to 58, and at other times, 68 to 100. The respiration varied from 18 to 24. A few hours before death both pulse and respiration became frequent.

Case XXIII.—Male, aged thirty-eight years, admitted in an alcoholic condition without a history; profuse haemorrhage from the left ear. The patient never afterward remembered having been hurt. During

the first week hearing was greatly impaired in both ears, and there was much mental confusion, with sensory aphasia and general loss of memory. General headache was severe and vertigo marked. The patient was enabled to recollect with great difficulty the place of his employment, and could only suggest his occupation as a waiter by using an imaginary corkscrew in dumb show. The right radial pulse on the second day was fuller and stronger than the left. In the second week hearing was quite restored in the right ear and was nearly recovered in the left. The mental condition became normal, and there were no further symptoms. The temperature on admission was 99.2°, and did not subsequently exceed 100°+. The left axillary temperature was .2° higher than the right when there was a lack of symmetry. The pulse on admission was 80, and was only once above 100. The respiration was from 18 to 24.

Case XXIV.—Male, aged forty years; fell six feet into an area way; consciousness lost, and not restored at time of admission, but sensitiveness to external impressions retained; profuse haemorrhage from right ear; left radial pulse fuller and stronger than the right; pupils contracted, but responsive to light; right corneal reflex diminished; right side and right face paretic, and urine retained. The pupils became normal on the second day, and the radial pulses symmetrical on the third, with some signs of returning consciousness. Convulsive movements of the extremities occurred on the fourth day, and there was some dysphagia. The patient gave little evidence of intelligence till the end of the fourth week; he had no power of speech beyond the utterance of an occasional single word, and when his attention could be attracted, which was not often, replied only in inarticulate sounds; he rarely recognised his immediate family, and had no apparent comprehension of what was said to him. The right facial paralysis continued, with added ptosis of the left eye, and both pupils became dilated. His mind then became clearer, but intelligence was very limited; he articulated several words with moderate distinctness, and a little later used several short phrases with propriety; a little later still his attention could be momentarily fixed to comprehend and answer monosyllabically a simple question. An ophthalmic examination made by Dr. Callan disclosed no retinal changes. At the end of the sixth week he began to notice what went on about him, recognised his mother, and developed destructive tendencies. Early in the seventh week he first gave attention to the natural offices of the body, and his increasing range of words accentuated his aphasia. After the second month there was only a trace of facial paralysis, and no other paretic condition. He could dress himself, and went about the ward; he could remember, and could write his name and address correctly, and seemed to readily understand such questions as were asked him, but replied in an endless tirade which was incoherent and largely made up of inarticulate sounds interspersed with recognisable words, and apparently as devoid of meaning to himself as to the listener. He was unable to write from dictation more than a few

words before the written characters became incomprehensible, and he repeated words. He had no knowledge of his occupation, manner of injury, or local surroundings. He was discharged at the end of the third month, and had then upon cursory examination no symptoms of mental disorder remaining, except some hesitancy in collating words, and in long sentences a little confusion in expression. If an attempt was made, however, to engage him in a sustained conversation, his thoughts became more and more entangled; he talked rapidly and excitedly, and his words were inextricably jumbled together. Upon examination four months later, his mental state was that of dementia.

The temperature on admission was 98.4°, and reached its maximum, 102.6°, on the second and third days. It then gradually but irregularly declined. It was occasionally normal after the first week, but ordinarily 99°+ or 100°, quite up to the time of the patient's discharge from the hospital. The right axillary temperature was the higher twenty-two times, and the left twelve times, and the two were uniform once, in thirty-five observations made during the first nine weeks. The left was afterward usually 2.10° to 2.10° the higher. The pulse did not exceed 90 after the fourth day, and the respiration was at no time more than 22.

Case XXV.—Male, aged forty years; fell two stories from a fire escape to the pavement below; was conscious and delirious when seen by the ambulance surgeon. There was a small linear wound in the left antero-inferior parietal region, haemorrhage from mouth and nose, and lack of urinary control. Mild delirium and great restlessness continued for twenty-four hours, and the right side and extremities were noted to be warmer and in more active motion than the left. On the second day there was post-cervical rigidity, and the patient became more difficult to rouse. On the third day both pupils were somewhat dilated, the face was flushed, and he lay motionless, with eyes closed, irresponsive to questions or to irritations. On the fourth day post-cervical rigidity disappeared. On the sixth day urinary and faecal control was regained. On the seventh day the patient, fully aroused from his condition of stupour, became restless, and was delirious through the night, but not afterward. From this time he suffered only from mental disorder. He had confusion of ideas and failed to recollect any of the circumstances which preceded his injury, or in fact that he had received a hurt. He had no appreciation of his surroundings, and gave fanciful explanations of his presence in a hospital when interrogated. His mind was alert and his speech coherent. During the second month he suffered an attack of facial erysipelas upon the side opposite the original wound, and was actively delirious. His mental processes were afterward slow, and when questioned he remained long buried in thought before making answer, which, when made, though hesitating, was fairly intelligent. He had come to realize that he was in a hospital but was still ignorant how he happened to be there; "supposed," he had been hurt. The temperature on admission was 97.4°, rose during the day to 102.2°, and was afterward usually from 99°+ to 100°+. The right axillary temperature was 1° to

2.10° higher than the left during the first week, and the left the slightly higher of the two, after that time. The pulse and respiration were practically normal at all times.

Case XXVI.—Female, aged twenty-eight years; gunshot wound through right temporal region inflicted during a paroxysm of suicidal mania; ball of thirty-two caliber; primary unconsciousness. On admission three hours later no general symptoms; wound of entrance, half an inch posterior to right external angular process, Y-shaped, three quarters of an inch in length in each of its arms; surface powder-stained, some grains of powder imbedded in the substance of the temporal muscle, but none in the skin; profuse haemorrhage had occurred from the wound and still continued from the mouth and nose; bullet entrance through the bone small and circular and covered by a valve of muscular tissue. On examination the patient was fully conscious, rational, and self-possessed. The right eye was swollen, the lids ecchymotic, and vision on that side entirely lost. The ball had passed from the temporal fossa beneath the lesser wing of the sphenoid and through the floor of the middle fossa at the margin of the sphenoid body. The track was easily followed through the anterior cerebral lobe, and the bony margin of exit could be defined by slightly opening the blades of the short bullet forceps which had been inserted. A small portion of brain matter, not larger than a pea, escaped from the external wound. On the following day she was rather stupid, and another trivial amount of brain matter was extruded. On the third day the left eyelids became moderately ecchymotic and the right side of the face and neck much swollen and painful. There were convulsive movements of the hands and feet, and a loss of smell in the right nostril was confirmed by careful examination. On the fourth day she was quiet and somnolent and had some headache. The left side of the mouth was drawn a little upward and tenderness existed behind the left ear. On the fifth day somnolence and headache ceased, pain and swelling of the right side of the face and neck diminished, and the mental condition became brighter. On the tenth day she was restless and began to suffer pain on the right side of the head, which, on the succeeding day, was intense. The eye became more vascular, swollen and prominent, and on the fourteenth day was extirpated under ether. At the end of a month the bullet wound of entrance had become simply cutaneous and was in process of cicatrisation. The swelling of the right side of the face and neck and the tenderness behind the left ear had ceased to exist. The pain on the right side of the head, which persisted in some degree, was no longer constant or the source of any considerable discomfort. There had been no indication of any form of mental impairment at any time since the slight hebetude on the second and third days after the reception of the injury, and no loss of faecal and urinary control.

The temperature on admission was 100°; rose to 102.4° in twelve hours, and declined to 99.8° on the second day, and then varied from 101°+ to

99°+ till the twelfth day; it did not exceed 100° after the fifteenth day and was subsequently from 99° to 100°. The right axillary temperature was habitually two tenths of a degree higher than the left. The pulse was from 72 to 80 till the third day, from 68 to 52 till the twelfth day, and subsequently from 70 to 78. The respiration was 28 on admission and afterward normal—16 to 22.

In the sixth week the wound had healed and there were no symptoms. At the end of three months her mental and physical condition is normal, and in her own opinion better than before the injury was received.

SUMMARY.

The differential diagnosis of the intracranial lesions has been incidentally established in the consideration of their individual symptoms. There are few instances in which the nature of the essential lesion and of its complications can not be determined with substantial certainty, and in a considerable proportion of cases its location even can be fixed with some approach to precision. The fact that an interval of time may be required for the evolution of symptoms is paralleled in the case of idiopathic diseases affecting the great cavities of the body; it can scarcely be considered a special diagnostic difficulty, therefore, in the present class of traumatisms. In lesions of the parenchyma the delay is unimportant; in haemorrhages of the form in which promptitude in diagnosis is demanded by the necessity for promptitude in action, the development of the case is likely to be correspondingly rapid and decisive.

The existence of superficial injuries of the head, the evidences of fracture, and the elevation of temperature, individually or collectively, together with the usual processes of diagnostic exclusion, will be sufficient to determine the fact that some encephalic injury has been suffered. The further determination of the special lesion which dominates the case presents difficulties which, while not insuperable, are often considerable. It is perhaps useless to attempt a more condensed summary of points in differential diagnosis. I have already incidentally stated them as succinctly as seemed compatible with their proper presentation; but it may be of ser-

vice to recall, or to reiterate, some of the more important diagnostic indications which the study of symptoms has suggested.

Haemorrhages.—The morbid conditions which may directly result from traumatic intracranial haemorrhages are: An abnormal temperature, a complete or partial loss of consciousness, a change in the character or frequency of the pulse or respiration, a disturbance or abrogation of muscular function, and an irregularity of the pupils. These conditions are subject to complication, modification, or supersedure by the symptoms of coexistent lesions.

A continued subnormal temperature is characteristic of large and comparatively uncomplicated haemorrhages, and as these are more frequently of epidural character, it may be regarded as to a certain extent diagnostic of the variety as well as of the class. The absence of symptoms indicative of parenchymatous injury will be confirmatory of the opinion that an existent haemorrhage is derived from the epidural vessels. Associated symptoms of diffused contusion suggest a pial, and those of laceration a cortical, haemorrhage. In the majority of cases the primary record of temperature is from 99° to 99°+, and in any case in which, then or afterward, it exceeds 101°+, or probably 100°, the elevation is due to an associated lesion. It follows that in pial or cortical haemorrhages the temperature has a higher range than in those of epidural origin, and is proportionate to the extent and importance of the complication. The bilateral variation to which the axillary temperatures are subject is not peculiar to this result of injury.

The primary unconsciousness, which is of frequent occurrence in cases of haemorrhage, is a symptom of complicating general contusion; the secondary unconsciousness, due to the loss, as well as pressure of blood effused, follows with or without an interval of restored consciousness, dependent upon the severity of the diffused injury of the parenchyma and the rapidity of the haemorrhagic effusion, and is partial or complete in proportion to its amount. Consciousness is

always lost in fatal cases; it is retained in fifty per cent. and more in recovering cases, even in those demanding operation.

The character and frequency of the pulse have no definite relation to the form, location, or amount of haemorrhage. The pulse may be normal, slow, or frequent in large extravasations wherever situated; but frequency is of so much more usual occurrence in haemorrhage than in other intracranial lesions that when noted it may be considered fairly diagnostic, with the numerical probabilities in favour of its epidural character. The bilateral variation in the force and fulness of the arterial pulsations is common to haemorrhages and to injuries of the brain substance, and of importance, therefore, only in general diagnosis.

An alteration in the character or frequency of respiration is almost invariable in fatal cases in which haemorrhage is an approximately isolated lesion. When the effusion is upon the convex surface of the brain, respiration is usually frequent and often stertorous; when at the base posteriorly, it may be frequent with cyanosis, or if pressure is made upon the medulla, it becomes progressively slower until it ceases altogether, though cardiac and arterial pulsation may still continue. In recovering cases it is habitually unchanged. In complicated or mixed cases it, like the pulse, perhaps as a resultant of opposing forces, very generally remains normal; and if abnormal, it is more likely to be stertorous than unduly slow or frequent.

General or local paralysis and disordered muscular action may be direct symptoms of haemorrhage compressing or irritating recognised centres of muscular control; tetanic spasm is not infrequent, but clonic contractions are of rare occurrence, except as the result of an associated lesion.

The pupillary condition usually suffers some change, but none which is characteristic. Every possible combination of contraction, dilatation, and normal condition, with the single exception that contraction of one pupil never occurs without some change in its fellow, is associated with every variety and situation of haemorrhage. Dilatation in some combination

is more commonly observed than contraction, but not more frequently upon the side of the effusion than upon the opposite; and not more characteristically with one type of haemorrhage than with another. In complicated haemorrhages dilatation of both pupils is more common and the effusion is more frequently bilateral than in the more nearly simple cases; and in unilateral dilatation is more likely to be on the corresponding side. A normal condition of the pupils is compatible with every variety of haemorrhage wherever situated, whether simple or complicated.

Sensory disturbances, as delirium or irritability, are not symptoms of haemorrhage, and when they occur are to be regarded as indicative of an accompanying lesion of the parenchyma.

Subarachnoid Serous Transudation.—The serous transudation from the pial vessels which occasionally results from meningeal contusion can not be connected with symptomatic conditions.

Arachnitis is either acute or subacute in form, and is typically caused by a diffused meningeal contusion, though exceptionally propagated from a point of localised injury. It is sometimes an immediate result of the meningeal lesion, and it may be insidious in its inception and progress, but its beginning is usually late and is sharply defined. Its invasion is likely to be marked by a distinct and rather sudden elevation of temperature and an evident change in the general condition of the patient. The subsequent course of temperature is erratic, and the characteristic symptoms are those of cortical irritation. The pupils are oftener normal than otherwise, and changes in the characters of the pulse and respiration are slight. The form of the effusion is not necessarily reflected in the course and nature of the symptoms. The question of infection is uncertain.

General contusion is a constant complication of all other forms of intracranial injury, but rarely occurs as an isolated lesion of fatal severity. Its symptoms are irregular in their development, course, and termination, and indefinite in their

mutual relation. This lack of conformity to any classical rule is due to the comprehensiveness of the lesion, its regional variations, and the fluctuations which occur from time to time in the distribution of the movable fluids upon which its manifestations mainly depend. A loss of consciousness, at some time and in some degree, is more nearly constant than any other individual symptom, and the conditions of temperature are more uniform than any of the other phenomena which it occasions. The temperature is not likely to be subnormal at the time of earliest observation, nor to exceed 99°+ ; its subsequent course in cases of intensity is progressive, with few recessions, and ultimately reaches elevations of high degree.

Primary, or early delirium, like primary unconsciousness, in both simple and complicated cases, is to be ascribed solely to the influence of this lesion. The diagnosis must largely depend upon the recognition of the fact of intracranial injury, and upon the further possibility of excluding its other varieties, or, if they exist, of segregating the effects which they produce from a distinct remainder of symptoms.

Limited contusion is comparatively infrequent, and when it occurs in scattered areas through the centrum ovale, is not distinguishable from the general form of the same lesion ; when it is cortical, it differs from laceration only in the extent of injury done to tissue ; and symptoms, if they result, differ only in degree. It is therefore practically impossible to diagnosticate it from those lesions in their mitigated form.

Laceration is almost, if not quite, invariably complicated by a concomitant general contusion, and by a resultant haemorrhage. The primary loss of consciousness, and the delirium of some grade or character which often precedes or follows its restoration, are attributable to the attendant general contusion. In trivial cases there may be no secondary symptoms which indicate the fact of laceration. The primary unconsciousness may be replaced by a condition of lethargy or blunted perception, passing through somnolence into coma and death. The primary stage is most frequently succeeded

by mental aberration or decadence, which may terminate in recovery, permanent dementia, or death. In exceptional instances consciousness may remain unimpaired, with extensive laceration of even fatal import. There is no necessary relation between the gravity or simplicity of the early psychic symptoms and the outcome of the case.

The temperature is higher than in any other form of intracranial injury, and, in cases destined to an early fatal termination, is characterised by a rapid and progressive increase, which sometimes continues for a certain time after death has occurred.

An irritability or abnormal sensitiveness to external impressions, often noticeable even after the supervention of final unconsciousness, and wanting in cases of haemorrhage or contusion, is of frequent occurrence.

Convulsions, especially in implications of the frontal or temporo-sphenoidal lobes, are frequent in fatal cases, and so infrequent in the history of other lesions that they may be regarded as characteristic. The presumption that they are occasioned by laceration rather than by haemorrhage is strengthened by a previous high temperature.

The loss of faecal and urinary control is common to all extensive lacerations without reference to the abrogation of consciousness or of muscular power. It rarely follows other forms of intracranial injury and is very nearly pathognomonic. The urinary and faecal discharges may be either unconscious or involuntary, or they may be the result of the patient's indifference to his surroundings. There are no demonstrated centres of control.

Paralyses are so much oftener the result of other lesions that they are of service only in determining the location of a laceration the existence of which has been already predicated upon more positive manifestations.

The pupillary changes have no greater diagnostic value than in haemorrhages; the pupils are, in fact, normal in a much larger proportion of cases.

The characters of the pulse and respiration are habitually

unchanged unless modified by the existence of complications. The contrast afforded by their substantially normal condition in an environment of pathic phenomena gives them the highest diagnostic value which they possess in this particular relation.

The bilateral variation in axillary temperatures and in the force and fullness of arterial pulsation, already noted as of unknown origin and referred to general diagnosis, is common to all forms of intracranial injury.

The manifestations of psychic disturbance are confined to cases in which the frontal lobes are implicated, but this implication is so constant as to make them practically symptoms of laceration in general. The other special symptoms which localise the seat of laceration have been already summarised.

The phenomena as indicated, which directly point to laceration, may be enumerated as certain peculiarities of temperature, psychic disturbances, loss of faecal and urinary control, and clonic convulsions.

Pyogenic parenchymatous inflammation is infrequent, and is of limited form, except when caused by the intrusion of a foreign body. Direct laceration and infection through the medium of compound fracture affords no question of diagnosis and is excluded from consideration.

The predisposing cause of traumatic central abscess is limited contusion; the exciting cause is supposed to be the admission of a pyogenic germ from some source external to the body. Though this supposition as to the source of infection may be correct, the further proposition that a route of entrance is always afforded by a superficial wound of the head is erroneous. Cases have occurred and are recorded in which no such wound existed.

The number of instances in which the histories of these limited pyogenic processes have been carefully observed or recorded is insufficient for the formulation of rules for diagnosis. The two cases which I have presented, and a third which I have noted, are in evidence of their uncertain symptomatology.

These conclusions are derived solely from the analysis of the cases which I have detailed, and are stated in as positive terms as the limited number of observations made will warrant. The series of cases presented, if insufficient to afford a basis for statistical inference, is yet so extended that the generalisations which it justifies are entitled to credence until controverted by results obtained from the study of a very much larger number of cases subjected to equally careful examination. It may be questioned whether deductions made, as in this instance, from the comparison of some hundreds of cases, are likely to be materially changed by any subsequent multiplication of their number.

Symptoms are so diversified, their combinations so varied, and their continuance is sometimes so brief, that constantly careful observation and equally careful record are essential to thorough comprehension of intracranial injuries. If there are few symptoms which are intrinsically pathognomonic there are many which by mutual relations of time and circumstance assume a pathognomonic character.

The possible multiplicity of lesions must be recognised, the relative as well as the absolute value of symptoms estimated, and if necessary some interval of time afforded for the development of the pathic condition; diagnosis becomes then neither more difficult nor more uncertain than in a majority of grave traumatic or idiopathic lesions.

FRACTURES OF THE INFERIOR EXTREMITY OF THE HUMERUS INVOLVING THE ARTICULATING SURFACE WITH REPORT OF TWO CASES OCCURRING IN CHILDREN.

By Douglas Ayers, M. D., of Montgomery County.

October 10, 1894.

Fractures of the inferior extremity of the humerus involving the articulating surface of the joint have always been regarded by surgeons as very difficult to treat and obtain satisfactory results. In reviewing the surgical history of these cases it is somewhat interesting to note the opinions given by surgeons who were the most prominent teachers and writers of the three centuries preceding our own. Paré, Heister, Petit, and Duvernay all considered it a very serious complication, and gave this singularly exaggerated picture "that the inevitable consequences were swelling and inflammation of the parts, continuance of pain after the reduction, abscess and even mortification of the soft parts, and caries of the bones, and anchylosis the most favorable termination." More modern thought and research, however, soon led to much more favorable opinions. Sir Astly Cooper in his "Lectures upon Surgery" says: "If the fracture in these cases extends without the capsular ligament, a bony union may with care be effected, but when entirely within the capsule, the union, as far as I have seen, is always ligamentous. After three weeks the surgeon should very cautiously commence the passive motion."

I quote from Ferguson's "Practical Surgery" the following: "In all fractures in this situation or in the upper part of the forearm I should strongly recommend the bent position

at first, and that after the lapse of three weeks or a month gentle movements should be commenced to obviate stiffness, which is very apt to follow such injuries."

The late Samuel D. Gross in his "System of Surgery" says: "I know of no fractures which I approach with more doubt and misgiving than those of the inferior extremity of the humerus involving the elbow joint. I know of none which are more liable to be followed by severe inflammation of the synovial membrane, extensive effusion, anchylosis, and deformity. Even in the more simple forms of these injuries, and where the treatment has been most skilfully conducted, there is generally great risk of an unfavorable result! At all events, a long time will be sure to elapse before there will be anything like a good use of the articulation. Passive motion is commenced at the end of two weeks and repeated every forty-eight hours until all danger of anchylosis is past."

The late Frank H. Hamilton in his "Practical Treatise on Fractures and Dislocations" says, as to the result of fracture of the internal condyle involving the articulating surface of the joint: "The fact that the lower fragment usually follows the motions of the olecranon, renders its replacement and retention comparatively easy unless some complication exists. It is not from the displacement, therefore, so much as from permanent muscular, and especially bony, anchylosis, that serious maiming so often results. Under any treatment bony anchylosis will very often ensue, and under improper treatment it is almost inevitable. Within seven days, and perhaps earlier, passive motion must be commenced and perseveringly employed from day to day until the cure is accomplished, indeed, in a majority of cases it is better not to resume the use of splints after this period, for although at this time no bony union has taken place, yet the effusions have somewhat steadied the fragments and the danger of displacement is lessened, while the prevention of anchylosis demands very early and continued motion." I quote from the "International Encyclopaedia of Surgery:" "A most important matter in the treatment of all these cases is the making of passive motion. This ought,

in my opinion, always to be begun as early as possible; but the proper time varies with the circumstances. When the line of fracture is wholly outside of the joint and the latter does not become swollen by effusions within its cavity, I think it well at the very first dressing, to grasp the lower part of the arm firmly but gently, and to slowly and quietly make flexion, extension, pronation, and supination, not to extreme degrees but freely enough to exercise the whole joint. Properly done this process involves no risk of disturbing the fragments, nor is it followed by any pain, tenderness, swelling, or other evidence of inflammation. Even if the joint is involved in the breakage I think that as soon as the inevitable inflammation has subsided, passive motion may be very gently made, and with advantage,—perhaps at first the movements may be limited to pronation and supination, and flexion may be added subsequently, extension being postponed on account of the risk of tilting the lower fragment forward."

I take from the same work the following statistics as to the influence of age upon the frequency of this form of fracture. Those presented by Gurlt show that out of 194 cases of fracture of the humerus there were sixty-two cases between one and ten years of age, forty-two cases between eleven and twenty years of age; and of those which occurred at the lower end forty-four cases between one and ten years of age, twenty-one cases between eleven and twenty years of age, showing that the majority of these cases occur in the first decade of life. I have cited these authorities so fully in order to bring out more clearly the opinions of surgeons of the past and present, more especially as to the question of the propriety of early passive motion in this particular class of cases. The majority place the time at two weeks or longer, viz., Sir Astly Cooper and Duist two to three weeks, Ferguson three or four weeks, Gross two weeks, "American Text Book of Surgery" ten days or two weeks, Hamilton within seven days or perhaps earlier. My experience as to results in these cases would favour early passive motion, but

I refer particularly to this form of accident in the young, where nature institutes the processes of repair at so early a period that what of plastic matter may be thrown out in a few days will assist materially in steadying the fractured bones so that very gentle motion may be given. If it be but slight and at first simply consists of partial pronation and supination it will have its effect in preventing fibro-cartilaginous anchylosis, the result of inflammatory changes in the joint having its inception in plastic synovitis and embryonic tissue from bone and other joint structures. But I would prepare the parts for this by making every effort to control the inflammation from its inception, when exudation is just beginning to take place and when the capillaries are only partially obstructed. The application of cold is (in my experience) at this time one of the most important factors in controlling such inflammation and its results. I believe that what is done is most perfectly done early. That immobilization and elevation of the limb with the patient in the recumbent position are equally important, and that with these agents persistently and thoroughly made use of we may expect marked improvement in a few days, sufficient at least to permit gentle manipulation. I have followed this course for a number of years and do not remember an instance where inflammation seemed to be increased by such manipulation to an extent sufficient to interfere with the favorable progress of the case. I have chosen the two cases for report, illustrative of my method of treatment, because they were my latest and both terminated much more favorably as to the restoration of all the movements than I had reason to anticipate.

Case I. On the afternoon of September 2, 1893, Maggie W., aged six years (rather fleshy and large for her age), was brought to my office by her father, who gave me the following history: About one hour before she was returning home from a neighbour's where she had been for a small vessel of water. In going up the steps which led to the door of her house she slipped and fell, striking her left elbow upon the edge of one of the steps. I found the elbow considerably swollen and very tender. Chloroform was administered and a thorough examination made. I found a fracture of the internal condyle through the trochlae into the

joint as evidenced by the following symptoms: Crepitus was plainly felt by careful pressure and counter pressure upon the condyle, and marked mobility of the same by flexion and extension of the arm, also displacement of fragment and prominence of the olecranon process when extended and prominence of the lower end of humerus in the same position. I placed the arm at a right angle, carefully moulding the parts into place, having previously disturbed the joint as little as possible by my examination, and I might add that the father had supported the arm very nicely in bringing her to my office. A right angled splint of perforated tin was applied, carefully padded especially about the joint to keep the fragment in place, patient placed in bed, the arm elevated and cold water dressings applied. I saw her upon the following day. She had passed a fairly comfortable night. No increase of swelling. The next, in similar condition as on the preceding day. The third, less of swelling. The fourth, carefully removed all the dressings, found the parts but slightly swollen, gave very gentle partial pronation and supination, not sufficient to produce pain, supporting the joint carefully during the process by grasping with the hand. The fifth day no increase of swelling or tenderness, gave motion in the same way with the slightest flexion and extension. The sixth day gave the same treatment. The seventh day she having complained some of the application changed it for warm. Arm quite natural as to swelling. Carried all the movements a little farther, just far enough to increase the range of motion a little without producing but the slightest pain.

The following days up to the twelfth I followed about the same course as to motion, but little of swelling or tenderness at this time. Upon the twelfth I removed the splint permanently, supporting the arm in a sling. The degree to which it could be moved at this time was about midway between flexion and extension. From this time to the fifteenth day gave it daily motion. Upon that day I requested the mother to take it from the sling daily and instruct the little patient to use it, which she did very carefully by picking up little things and assisting the other hand. After the eighteenth day the sling was removed. The arm at this time could be flexed and extended slightly beyond the degree of the twelfth day, was more inclined to use it in her play and assist the other hand. I continued daily motion until the twenty-eighth day. At this time pronation and supination were quite perfect. Extension and flexion only about ten degrees short of normal. From this time for the following two weeks I saw her at intervals of three days, the father in the meantime giving the arm motion very carefully and intelligently. At this time pronation and supination were quite perfect. Flexion and extension nearly perfect, could be fully produced by a little force. After the sixth week she used the arm in her play quite well. Motion at intervals of a few days was given up to the eighth when it was not perfect but improving, at which time it was discontinued. Result at the end of one year, all the motions quite perfect. The only difference between the two is in the degree of extension. The uninjured arm can be extended a few degrees beyond a straight line. The injured one just to a straight

line. Measurements around the condyles of both arms show an increase of one third of an inch in the injured one.

Case II. On the evening of the twelfth day of February, 1894, was called to see Eddie D., aged three years. The parents gave me the following history: He had climbed upon a table about one half hour before, from which he had fallen, striking the right elbow on the edge of a chair. Elbow considerably swollen. Drs. Congdon and Burt, who had also been summoned, soon arrived, when the former kindly administered chloroform. Found a fracture of the external condyle, entering the joint seemingly through the articulating surface receiving the radius. The forearm somewhat flexed and pronated and fragment displaced outward with the radius. The parts were placed in normal position, the arm flexed, and a right angled splint was applied with the same care as to padding as in the former case. Patient was then placed in bed, the arm elevated, and cold applications applied. Doctor Burt, the family physician, took charge of the case from this time, kindly following my suggestions as to treatment, and furnished the following history: Arm examined carefully each day until the fourth, when the splints were removed, swelling much less, slight pronation and supination given in the same manner as in the first case. The fifth, as in the former case, slight flexion and extension. The following days up to the tenth, the same treatment was followed as in the first case. Upon the tenth day he fell and partially displaced the fracture. It was re-adjusted and the same treatment, viz., the cold water, continued. The case from this time progressed very favourably, the same course having been followed as in the first. The splints removed the twelfth day after the second accident, arm taken from the sling the eighteenth. At this time all the motions imperfect but improving. There was constant improvement from this time to the discharge of the patient at the eighth week. It is now eight months since the accident and the following conditions are reported: Pronation and supination quite perfect, as is also flexion and extension. Measurement around the joint one quarter inch more than the opposite.

The most important question to be taken into consideration in connection with the history of these cases, is that of early passive motion. Motion has been truly said to be Nature's great restorer of loss of function. It is motion that keeps every muscle of the body in a normal state as well as the circulatory system, thereby preventing deposits. There are those who argue that rest *per se* never produces anchylosis, and that while it produces great change in the tissues, muscular atrophy and marked diminution in the size of blood vessels, retardation of growth and supply of synovial fluid to the joints, yet that the re-establishment of motion even after a

very long period of immobilisation will restore the tissues and the functions of the joint, citing as examples the enforced rest of healthy joints, as the ankle in fracture of bones of the leg, and the knee when the long splint is applied for hip disease. This is true of these joints under the conditions mentioned, but it has been my experience that the elbow is an exceptional joint, especially when immobilised for fracture through its articulating surface, its peculiar conformation as to its depressions or fossae, more particularly the olecranon, the partial filling of which with plastic deposit, would soon materially interfere with extension by preventing the entrance of the summit of the olecranon, rupture of the orbicular ligament (which sometimes occurs as a complication) with deposits preventing the rotary movement of the radius. In a word it is a joint, the peculiar structure of which is such that only slight deposits or changes of the normal relations of its parts would interfere to a much greater extent with the natural functions than with that of any other joint in the body. The treatment that I have presented in this paper I have followed in nine cases that I have been called upon to treat which I had no doubt involved the joint, and in all but one, which was quite useless from injury to the nerve, I obtained good average results as to lack of deformity and restoration of function. In conclusion I offer the following summary. I believe that we will obtain the best results:

1. In careful and accurate diagnosis with the patient fully anaesthetised.

2. In carefully moulding the parts into normal position and retaining them by a nicely adjusted splint and padding.

3. By controlling inflammation by the recumbent position, elevation of the limb, and the application of cold.

4. Early and gentle passive motion, confined at first to partial pronation and supination, with very careful support of the joint during movement.

5. As early removal of the splint as the progress of the case will warrant.

DISCUSSION.

Dr. A. T. Van Vraken, of Albany county, said he wished to call to mind two features of the paper of which general practitioners generally lost sight. The specialist in surgery would always use an anaesthetic, but many in general practice failed to avail themselves of this important aid. No one should attempt to do anything with a fracture or a dislocation in a child without anaesthesia. Again, it was very important to put children to bed, for that was the only way of fully controlling them.

Dr. Cronyn said that at one time he had had much to do with this class of work. He did not think there was any other injury connected with surgical accidents that was so frequently the cause of suits for malpractice. It was a rare thing to succeed completely in making the elbow do its work as well as before the accident. In children of from three to six years the bones were still cartilaginous. One should not be satisfied with obtaining crepitus in children. In young subjects the plastic exudation at the elbow was prone to become bony. He had been in the habit of telling the family that he would do the best he could for the elbow, but that some deformity and stiffness would probably result. He would also tell them in the presence of witnesses, that if they knew of anybody who they thought could do better he would be pleased to have them secure the services of that surgeon. In one case he had been threatened with a law suit, but it had been dropped. He would advise every young practitioner to adopt this plan if he would avoid suits.

The speaker then recalled a case in which the joint had become a swivel joint, and the motion had been so great that the patient could readily pick a person's pocket without being detected. As a result he had spent most of his after life in the state prison.

Dr. Ayres, in closing the discussion, said that a case he had been called upon to treat about sixteen years ago, had first led him to make early passive motion. The patient was a girl of eight years, who, in falling, had struck a stone and fractured the elbow-joint. It was dressed in the usual manner, and was examined daily. He did not, however, attempt passive motion until the beginning of the second week, and then he found that it was quite impossible. He anaesthetized the girl several different times and relieved the deformity in a measure, but she was never able to flex the arm much beyond a right angle.

THE STEARATE OF ZINC COMPOUNDS IN ATROPHIC RHINITIS.

By Joseph S. Gibb, M. D., of Philadelphia, Pa.

October 10, 1894.

Consideration of a disease so prevalent, so disgusting, and so rebellious of treatment, appeals at the same time to the general practitioner and the specialist.

Perhaps from a feeling of incapacity or indifference these cases are often dismissed with general directions and a solution to use in an atomizer or douche. In consequence they migrate from one physician to another, often ultimately to fall into the hands of some one of the numerous charlatans who flock to our large cities.

With some little care and perseverance much can be done. It is with the view of recording my experience with a comparatively new drug this paper has been prepared. The plan of treatment, within outlined, commends itself to us because of its exceeding simplicity, and is within the power of any practitioner to apply.

If, as seems probable, it merely arrests the destructive process and renders the patient comfortable and unobjectionable to his friends it will have served us well.

I have taken the liberty of prefacing my remarks with a few on the nature and general management of the disease, feeling that, by so doing, the subject would be better elucidated.

Atrophic Rhinitis.—The name would imply an inflammatory condition with an atrophic element. When the cases come under our observation, usually there is rarely much of an inflammatory condition present, but there can be no doubt that the early history of these cases is one of inflammation. Bosworth has clearly demonstrated,[1] and I believe

[1] Bosworth: Diseases of the nose and throat; the nose and naso-pharynx, p. 162.

his views are accepted by a large number of rhinologists—certainly in the United States,—that the disease is the successor of that affection in children in which there is a purulent or muco-purulent discharge from the nose, and named for this reason, purulent rhinitis.

The atrophic element of a case is at once noticeable. Dilating the alae of nose we observe a roomy nasal chamber, the turbinates shrunken often to such a degree as to entirely obliterate the lower turbinate and contracting the middle so as to give an unobstructed view through the nasal chambers to the posterior wall of pharynx—a state incompatible with healthy function of the nasal chambers.

We also observe these turbinate bodies and especially the middle, covered by thickened crusts which, upon removal, leave a reddened and rarely an ulcerated spot on the mucous membrane. Before our investigation has reached this stage we are conscious of an all-pervading, disgusting odour emanating from the nose which is likely increased in detaching the crusts—this has given rise to the appellation, ozoena, a term, while highly descriptive of one symptom, *i. e.*, stench, cannot be used as a synonym.

Ozoena simply represents a condition present in many cases of the disease but not in all. The same condition is present in syphilitic and in carious disease, both of which are entirely distinct and will not enter into the discussion in the present article.

These two symptoms, the crusts and the ozoena, are the key-note of the management of this intractable disease. When we obtain a clear conception of their production and can apply means for their permanent eradication we have solved the difficulty. In making this assertion I have not lost sight of the fact that several important physiological purposes of the nasal chambers have been abrogated when this disease is well marked.

Though a firm believer in the role of the turbinate bodies in adding to the moisture of the respired air, so ably enunciated by Bosworth, and in their salutary offices in filtering

deleterious matters in the inspired air; and also cognisant of the important office of the nasal mucous membrane in secreting mucus, yet I cannot but believe that these offices can, in a measure, be compensated for, and indeed as we will see later in studying the pathology of the formation of crusts, this *must* be accomplished if we are to meet with success in getting rid of the obnoxious symptoms.

To meet with success in the management of a disease we must have clear ideas of its pathology.

What is the pathology of the formation of crusts and its accompanying ozoena? The limits of this paper forbid anything like a full description of this subject, we will advert to just sufficient to give us a firm basis on which to found our therapeutic means.

We have before stated the primary stage of atrophic rhinitis is one of inflammation; this inflammation is of sufficient intensity to be attended with suppuration; succeeding this we have a sclerosis or atrophy of the mucous membrane. The cavernous tissue of the turbinates and the glandular tissue are all involved in this process so that ultimately there is little left covering the bones but the connective tissue with a few glands whose function has become perverted from the contraction to which they have been subjected. What is the effect of this sclerotic process on the physiological purposes of the nasal chambers? The venous channels within the cavernous bodies, whose function it is to add to the respired air, moisture, and heat, are destroyed; hence the air passes through the nasal chambers poorly prepared for its ultimate purposes.

The large number of mucous glands contained in the membrane are also destroyed or perverted in their secretion to such a degree as to be totally inefficient for the purposes for which they were designed.

It is with this knowledge of the pathology we are able to give the most plausible explanation of the crusts and ozoena. The glandular secretion being denied, the large admixture of water which is normally present contains a large proportion

of solid matter, which collects on the turbinates and undergoes decomposition or fermentation—hence the odour.

With this view of the causation of the two essential elements of atrophic rhinitis before us, we should strive to adopt those measures of treatment looking to the restoration of these functions.

The first step should be the entire removal of all crusts from the mucous membrane. Unless we are faithful and persistent in our efforts in this direction we cannot hope to meet with success. This is but a necessary prelude to the important step of bringing into contact with the diseased mucous surfaces, medicaments of a stimulating nature, which will excite the perverted glands to secretion and mayhap aid in the regeneration of the mucous membrane. The methods of accomplishing this object will vary with the operator, it is immaterial; the object is absolute cleanliness.

The plan pursued at the Episcopal Hospital, Philadelphia, is about as follows: The nasal chambers are sprayed thoroughly with an antiseptic, detergent solution, *e. g.*, Dobell's Listerine or Seiler's Tablets; after which all rebellious or adherent crusts are removed by a small probe, the extremity of which is wrapped with a pledget of cotton; as this process is apt to be a painful one it is well to first prepare the sensitive mucous membrane by a preliminary spraying of a four per cent. solution of cocaine; by this means also the cleansing is done much more effectively.

Should the crusts prove unusually tenacious in their attachment or a layer of muco-pus cover the turbinates, the cotton-tipped probe is dipped in a solution of the per oxide of hydrogen and the crusts or pus dissolved away. This latter is succeeded by another spraying with the Dobell or any antiseptic spray to remove the dissolved and frothy mucus or pus. While this procedure will doubtless cleanse the anterior nares, there still remains a large surface uncleansed, viz., the posterior surface of the turbinate bodies and the vault of the pharynx—the latter especially being liable to be the seat of inspissated mucus.

The post nasal surfaces are probably better and more easily cleansed by the post-nasal syringe or by atomisation. However, even in this locality the crusts are frequently so tenacious as to defy the usual methods of syringe or spray. In such cases they must be removed by means of cotton-tipped probe bent at such an angle as to pass readily behind the soft palate and up to the vault of the pharynx.

To effect this satisfactorily, and to avoid wounding the sensitive tissues of the upper pharynx and vault and even the pharyngeal orifice of the eustachian tube, it should be done under full illumination by the aid of a rhinoscopic mirror.

I have dwelt thus on the details of cleansing, doubtless familiar to all present, to emphasize the fact that without it all subsequent treatment will be futile.

Assured then that our cleansing has been effective, we are ready to apply to the mucous surface our medication.

The stearate of zinc compound has for its base stearate of zinc to which may be added any drug which the operator deems necessary for the case.

It is dispensed as an amorphous powder, which has a saponaceous or oily feel when handled and has a peculiarly strong adhesiveness to mucous surfaces.

Drugs in powder form have for many years been used in the treatment of atrophic rhinitis, but within a few years past there has been a tendency on the part of rhinologists to discard them from their armamentarium.

I think the reason for this has been the exceedingly limited time a drug in powder form could be depended upon to adhere to the mucous surfaces and hence the utter unreliability as to the beneficial effects accruing therefrom. It has occurred to me that possibly whatever merit the stearate of zinc compounds possess, is due to the tenacity with which they adhere to the mucous surfaces and thereby exert an influence for a prolonged period.

The indications for treatment, as before stated, are that we shall have some drug of a stimulating nature for the purpose of exciting the perverted mucous glands to increased activity

and if possible aid in the regeneration of the destroyed tissue.

Europhen[1] was the stimulant selected to incorporate with the stearate of zinc. After the cleansing process a powder of stearate of zinc with europhen twenty-five per cent. was blown into the nasal chambers by the insufflator so that a thin layer of the powder was apparent over the middle and lower turbinates and the septum.

The observations in the use of this drug have extended over a period of a year and a half at the clinic of the Episcopal hospital, Philadelphia.

It includes fifty-four carefully selected cases, *i. e.*, those in which crusts were invariably present and in the majority accompanied by ozoena.

All cases presenting simply an atrophic or rather sclerotic condition of the turbinates, unaccompanied by crusts or ozoena, have been rigidly excluded for the reason that they admitted of a doubt as to the diagnosis between the secondary sclerotic change of hypertrophic rhinitis and the disease in question.

All these cases were in dispensary service, a source admittedly difficult and unsatisfactory in making deduction or drawing conclusions.

As a matter of convenience and the better to study the results, these fifty-four cases have been divided into three classes :

1. Those that were persistent in treatment and faithful in attendance—of this class there were twelve.

2. Those that presented themselves at the clinic at irregular intervals, though were seen at times over nearly all the period of these observations, namely, eighteen months. This class numbered twenty.

3. Those that presented themselves but once or twice after the first treatment. These latter, numbering twenty-two, have been excluded from all deductions, therefore the observations may the more properly be said to cover thirty-two cases.

[1] Europhen--U. S. Dispensatory, 1894, *p.* 1628.

The treatment was employed twice weekly. In the interim of the visits the patients were directed to use a hand atomizer containing a solution of Seiler's Tablets.

After the first cleansing and subsequent insufflation there was in all cases an entire absence of odour, and in the larger number this was persistent, no odour being perceptible upon any of the subsequent visits.

It is quite patent to all rhinologists that simply cleansing is not sufficient to effect this result.

In five of the most pronounced cases an odour was still perceptible at three, or at the most four, visits subsequent to the first cleansing and treatment, after which it entirely disappeared in the three which belonged to the first class, while in the two which fell under the second class, after the fourth or fifth visit, the odour, though still present, was markedly diminished; leaving me to infer that had the treatment been faithfully continued the result would have been the same as in the first class.

As to the crusts: in the large majority of cases no crusts formed after the first treatment. The appearance presented at the subsequent visits was a thin layer of a muco-purulent secretion covering the turbinates, which became smaller and smaller in quantity at each subsequent visit until finally it disappeared, leaving the turbinates moist, and free from the dull, glazed appearance so familiar to all.

While this was the general result, in the five cases above noted as persisting in odour, of an unusually rebellious nature, the crusts adhered tenaciously, but even in these, after three or four insufflations, the three cases belonging to the first class showed a marked improvement. In two of the three the crusts, and finally the muco-purulent secretion, entirely ceased, leaving the mucous membrane as already described.

In the remaining one this thin muco-purulent secretion still persists, notwithstanding there is an amelioration of all other symptoms both subjective and objective.

In one of the cases of the second class, or that of indiffer-

ent attendance, after an interval of nearly two months, in which time even the cleansing at home was continued in a very irregular manner, there was a reappearance of crusts, but in no such number or of as great tenacity as when the treatment first began; they were easily dislodged with ordinary spraying.

In the remaining case of the second class, where the cleansing at home has been carefully done, though attendance at clinic has been irregular, the crusts have disappeared though there is some muco-purulent discharge.

In all the cases, after a few insufflations, the nasal mucous membrane presented an entirely different appearance—the dry, shrunken, lifeless, membrane gave way to a reddened, moist, and actively secreting surface.

In two of the cases in which the improvement was the most marked, there seemed to be something like a regeneration of the turbinate tissue, though I am not prepared to admit that this is really the case. While there undoubtedly is an increase of tissue over the shrunken turbinates, this has not assumed the appearance of true cavernous tissue.

To sum up: in a total of thirty-two cases which have been under observation—the shortest time being two months, the longest, eighteen months—there were twenty-seven in which there was a complete disappearance of crusts and odour in two of the cases promising a restoration of normal function and structure.

In five the results are very doubtful, though of sufficient improvement to promise more for the future.

What is the rationale of this treatment? The first thorough cleansing enables us to apply a stimulating preparation for a long period of time to the mucous surfaces, thus exciting the remaining mucous glands to increased activity, throwing off larger quantities of water, which, bathing the tissue, prevents the formation of crusts and the consequent odour.

It may be said by thorough cleansing we accomplish all that is claimed for this treatment. I have never seen, even

where the utmost care has been observed in cleansing both by the physician and an intelligent patient, such thoroughly clear nasal chambers as after a few weeks' treatment of combined cleansing and stearate of zinc compounds.

Again, while it is true that thorough and persistent cleansing removes all odour, and, in a measure, crusts, there still remains that dry, unhealthy, glazed mucous surface—here to me is the most noticeable beneficial change.

While subjective symptoms play a very unimportant role in making up our prognosis in this disease, it has a most important bearing in the mind of the patient. The testimony of those who have taken this treatment is the same, that it is followed by great relief to the feeling of fullness and dryness and other uncomfortable sensations about the head and throat, and that this persists nearly up to the time for the next treatment. I firmly believe were there not some relief to the feelings of the patient, we would not have had even as many as twelve to return each time and twenty more to return at intervals in fifty-four cases.

These insufflations have been made bi-weekly. It has occurred to me that perhaps a more frequent, say daily, use would produce results more promptly and be more lasting.

It could easily be accomplished with an intelligent patient by first instructing them as to the method of cleansing by means of an atomizer, to be followed by blowing the powder into the nostrils. The method of Ingalls, of Chicago,[1] commends itself to me to accomplish this latter manoeuvre.

It cannot be claimed that the drug is specific, indeed it is too early to even assume that it is of real benefit; all that can be said is that the trial justifies a continuance of the plan and a further study as to the permanency of the effects.

[1] Ingalls: Journal of Am. Med. Ass'n, September 15, 1894, p. 24.—"By means of a glass tube about 4″ in length with a calibre of about ⅛ in., which is attached to a rubber tube through which the patient blows the powder into his nose. The glass tube is disconnected from the rubber, its round end moved about in the powder until it is filled up about ¼ in.; the same end is then reintroduced into the rubber tube and the flattened end of glass tube introduced into nostril. The patient then places the other end of the rubber tube between his lips and gives a quick, strong puff, which forces the powder into the nares."

There may be other methods just as serviceable, but to me this has rendered the best service because of its simplicity of application, its effectiveness in relieving the distressing symptoms, and the comfort which it seems to induce.

DISCUSSION.

Dr. Dwight L. Hubbard, of New York county, said that the paper seemed to him of very great importance. The subject of which it treated was one very little understood by the general practitioner. In his six years of service in the throat department of the Manhattan Eye and Ear hospital he had seen a great deal of this affection, and he felt that the author was to be congratulated on his terse and accurate description of atrophic rhinitis. It was a disease most obstinate to treat, yet if it were more generally recognised, better results would follow. It seemed to him that the method of cleansing recommended in the paper was *the* feature, although he could, from personal experience, vouch for the value of stearate of zinc. He had tried it for two years, and published the result. He had found that applications of ichthyol, used in full strength, would yield excellent results, but he thought those who experimented with weaker solutions of ichthyol would be disappointed. He was glad to hear the author insist that ozoena was a symptom and not a disease.

Dr. Gibb, in closing discussion, said he was very glad of the endorsement of his paper by Dr. Hubbard. He would admit that the larger part of the benefit was due to the cleansing, but, as he had said, he had never obtained such good results from cleansing alone. He had also tried the europhen separately from the stearate of zinc, but the result had not been so good. It was the adhesiveness of the stearate of zinc and the tenacity with which it clung to the mucous surfaces that explained its beneficial action. It would be better, it seemed to him, to treat the cases earlier, and thus check the process before the mucous glands had been destroyed by the atrophic process. The treatment advocated in the paper had been adopted also at the Philadelphia polyclinic during the last two months, and had been looked upon favourably.

FATAL SUPPURATIVE CELLULITIS FOLLOWING AN INJURY TO THE HAND.

By William H. Robb, of Montgomery County.

October 11, 1894.

In the treatment of wounds twenty-five years ago we were not disappointed if suppuration occurred during the reparative process. Union by first intention did occasionally occur; but it was the exception and not the rule. If the pus appeared laudable and was not excessive in quantity we were satisfied. We were sometimes obliged to wait a long time to see nature fill in and repair the injury with new granulation tissue. The rapidity of the cure was thought to depend largely on the patient and on the part injured. Little was expected from any particular dressing. Nothing had been discovered to prevent suppuration. In fact, we did not know the cause of suppuration in wounds. In our profession great advance has been made in every department. Surgery in particular has been revolutionised, and nothing has advanced surgery more than the discovery of the true cause of suppuration. It is now known to depend on the presence of certain living micro-organisms in the wound. Their life history has been studied. The effect they produce on living tissue has been described.

Destructive suppuration depends on the presence in the wound of one or more of these germs. Suppurative cellulitis follows the introduction of these germs into the wound. Those that interest us particularly are described as bacteria, micro-organisms, or microbes, and they belong to the lowest order of the vegetable kingdom. Bacteria are to be found everywhere, and are said to be found in the interior of the healthy, living tissues. They exist in the air, the soil, the water, in our clothing, on the surface of our bodies, and on the mucous membrane of the alimentary and respiratory tracts.

The principal forms of bacteria are the micrococcus or globular form, the bacillus or staff shape, and the spirillum or spiral shape. The micrococci when developing rapidly are seen often in the stages of division, and being grouped in "pairs" are called diplococci. When rearranged in rows or "chains" they are called streptococci. When bunched together in "grape-like" masses they are called staphylococci. They multiply by fission. They grow only in a temperature varying from 86° to 104° F.

The pathogenic bacteria grow best in a temperature of from 95° to 104° F. Freezing does not destroy them. Boiling water will in a few minutes kill them.

Those with which we are now particularly interested are the pus microbes. Of these several varieties exist. I shall mention only those that are usually found in suppurating wounds. The one most active in the production of pus and most frequently found in wounds is the staphylococcus pyogenes aureus. It softens and liquifies the tissues by a process of digestion.

The staphylococcus pyogenes albus and staphylococcus pyogenes citreus are two other varieties of this microbe that are occasionally found. Suppuration following the introduction of these cocci is circumscribed or local.

The streptococcus pyogenes is another variety of the pus germs. They seem to penetrate the healthy tissues and thus carry the suppuration process to surrounding parts. I doubt that they are always transported by the lymphatics. This was the variety of micro-organism found in the case of suppurative cellulitis that I am to describe.

Following the description of pus germs and the effect they produce on injured tissues came the announcement of a new method of dressing wounds. Suppuration could be prevented. The pyogenic germs could be excluded. The antiseptic method was described. Lister perfected, systematised, and gave it to the profession.

While some doubt and ridicule this treatment, I am safe in saying that not a single surgeon of distinction in any land

disregards the principle underlying this method. It has been modified somewhat in detail. In dressing wounds it is our object to render the parts aseptic and to use such means as will exclude the introduction of bacteria. When this has been done successfully we expect the parts to heal without suppuration. If we fail in securing this result we suspect that something in the detail has been omitted.

It was my failure in obtaining desirable results that I had anticipated and looked for after dressing an injury, that prompted me in reporting to the Association a case of "Suppurative Cellulitis Following an Injury to the Hand." This I will do as briefly as possible.

The person injured was a man, white, and a native of Scotland, fifty-eight years of age, weighing in health from 145 to 150 pounds, measuring in height five feet, eight inches. His ancestors were healthy and free from any constitutional taint. He had never suffered from any specific disease. At the time of the injury he was a *little reduced in weight* and *possibly in health* by anxiety over business affairs. By occupation he was a manufacturer of knit goods, and by trade a spinner. Being one of the proprietors in the business, as well as a qualified operative in the mill, he was in the habit of looking over the various departments of work as a superintendent. At the time of the injury he was engaged in oiling the gearing of an exhaust fan located in the basement of the building. This fan is constructed of four metal blades about two feet in length, and at the time was revolving at the rate of 850 times per minute. The injury was received at 11:45 a. m. The parts removed were the thumb and fore finger together with the whole of the first metacarpal bone, and a portion of the second metacarpal bone of the left hand. The injury extended from the union of the first with the second finger, up obliquely across the second metacarpal bone and separated the first metacarpal bone from its articulation with the trapezium. The soft parts were as smoothly cut as if they had been severed with an axe. The hand was immediately wrapped up in new cotton goods, covered over with knit goods found in the mill. This dressing remained on the hand until 3:30 p. m. when I arrived. I wish to draw your attention to this particular point as I shall refer to it later.

Three hours and forty-five minutes elapsed from the time the injury was received before any preparation was made to cleanse and dress the wound. Preparations were immediately made to dress the hand antiseptically. With the assistance of Dr. T. and Dr. L. and preliminary to the dressing, the remainder of the second metacarpal bone, together with the trapezium, was removed. After all oozing had ceased and the wound had been, as we believed, rendered aseptic, the usual dressings

were applied. This dressing was applied on the 27th day of February, 1894. Three days later symptoms of sepsis were developed. The temperature began to rise and during the following week reached 102° F. It remained at this point for the two weeks following, after which it dropped to 101° F. After the 21st of March, until the death of the patient, his temperature fluctuated irregularly between 99° F. and 101° F. The pulse rate rose with the elevation of temperature and at the end of the third week its average beat was 110, and late in the disease 140, per minute. No chill preceded these symptoms, neither did he suffer from chills from first to last. As soon as the septic symptoms were noticed, on the third day after the injury, we opened and removed the dressing and found, to our disappointment, that suppuration had occurred. At this time the suppurative process seemed to be confined to the subcutaneous cellular tissue. There was but little swelling and no perceptible redness about the wound. The suppurative process seemed more marked than the inflammatory. This condition prevailed throughout the whole course of the disease.

From the edge of the wound where suppuration first began the cellulitis slowly extended over and around the back of the hand down to the fingers, up and around the wrist, and slowly up and around the forearm. It seemed to advance from cell to cell in a circular manner, first destroying the sub-cutaneous cellular tissue, and later including that between the muscles. The muscles and bones were not attacked. The skin was left to die of starvation. It would slough off in small fragments a few days after its support had been removed. Suppuration seemed to be the active as well as the destructive process. Suppuration was greatly in excess of inflammation. The secretion of pus was excessive. Very little swelling and no perceptible redness marked the spread of the disease. No heat or burning pain was complained of. In fact, in the very beginning of the disease the only complaint made by the patient was of an indefinite soreness in the hand and forearm. Later the dressing became very painful.

The cause of suppurative cellulitis in this case was, I believe, the introduction into the wound of the pus microbes, viz.: staphylococcus pyogenes aureus, staphylococcus pyogenes citreus, and the streptococcus pyogenes. In support of my belief I submit a letter received from Dr. Theodore Deecke, of Utica, to whom I sent samples of pus, with fragments of partially destroyed cellular tissue taken from the diseased arm. Dr. Deecke's letter reads as follows:

DEAR DOCTOR: Saturday last week I received a letter from a friend in Bonn, Germany, to whom I mailed some of the pathological material received from you for examination. The object was, since I am not so thoroughly familiar with all branches of to-day's bacteriology, to get the

opinion of an authority in that science. Yet he concurs with me that no other microbes were present to any extent than three species of staphylococcus pyogenes and two of the streptococcus pyogenes, and that distribution of them took place through the lymphatics in the subcutaneous tissue principally. Of particular interest was for me to know more of the occurrence of these microbes and to receive the information that they have a wide field of distribution. They are found, not only very frequently on the skin of the human body, under the fingernails, etc., they also grow especially on the hairy skin of all domestic animals, and besides in all kinds of moist waste material and dirt, even in waste water, in which the presence of soap does not hinder their development. But there is one strange thing about them (although it is the same thing as it seems with other microbes) that they are by far more dangerous and more virulent in their action if several species of them, at least more than one, are present. It is evident, therefore, that the patient became infected by or from the material he was handling at the time of the injury, and later from germs that he had on his or in his person.

I believe these germs were introduced into the wound immediately after the injury was received. They had three hours and forty-five minutes to bury themselves under the surface into the cellular tissue beyond the reach of germicidal washes. From the first they had the advantage. They kept in advance and beyond our reach. Local treatment had no effect whatever in staying its destructive progress.

From the day of injury, this man was fed liberally, and of the most nutritious food. He was kept in a large, airy room. He was supported later by the consumption of large quantities of brandy. His digestion was good throughout. At first he was given regularly large doses of chloride of iron and later sulphate of quinine and strychnine were added. From the third day the wound was dressed every day, and after the second week twice daily until the 24th of April.

As the disease progressed steadily, many openings were made through the skin, one for the escape of pus, another for the introduction of a drainage tube. In spite of drainage tubes, free incisions, antiseptic washes, and dressing, the destructive suppuration advanced. It had reached up over two thirds of the forearm and no signs of it stopping. It was now the 24th of April. A consultation is again held (several had been previously held). Dr. M., Dr. T., Dr. L., and Dr. C. are called in. All the doctors agreed that amputation of the arm would give the man the best chance for his life. Amputation was made through the *arm* at the junction of the lower with the middle third by the circular flap method. The corrosive sublimate solution 1 part to 1,000 of water, was used in dressing the stump. We hoped by this amputation to cut off

the microbes with the diseased forearm and prevent their further destruction. We believed that we had stepped, as it were, beyond their reach. For the four succeeding days everything seemed promising, but on the fifth day septic symptoms were renewed. On removing the dressings we found suppuration had already begun in the cellular structures of the stump. From the 29th of April until the 24th of May the stump was dressed twice daily. The disease had by this time advanced half way up to the shoulder. The same assistants were called in, and agreed that amputation at the shoulder would afford him the only chance for life. This operation was made on the 29th of May at 3 o'clock p. m. The patient survived the operation but died at 6:30 the same evening from shock.

In conclusion I believe we can make the following suggestions:

That every surgeon should hold himself ready to attend an injury at a moment's notice.

That antiseptic dressings should be kept in readiness for immediate use.

Injuries, however slight, should be carefully dressed without delay.

We should encourage the use of hot water applications to the injury before the arrival of the attendant.

DISCUSSION.

Dr. J. D. SULLIVAN of Kings county, said he had had a similar case resulting fatally from a compound dislocation of the thumb. In this instance he had blamed tight bandaging for the result. He would like to know with regard to the bandaging in the author's case, and also what solutions were employed.

Dr. ROBB replied that the arm had been shaved and the parts thoroughly cleansed with a one to thirty carbolic acid solution. After the oozing had all stopped, silk "protective" was applied to the wound, and over this eight thicknesses of carbolised gauze wrung out of one to thirty carbolic acid solution. No attempt was made to stitch the parts together. The dressings were loosely applied from first to last, and catgut ligatures were used on the vessels. The man was hurt in a room in the basement of the mill where the washing was done. It would seem probable that this room was literally alive with germs, and that the dressings were also full of microbes which had had nearly four hours to penetrate the tissues before any antiseptic solutions were applied. In making the dressings and counteropenings, the same carbolic acid solution was used, but after the amputation this was changed to a one to one thousand sub-

limate solution in the hope that this latter solution would more effectively combat the development of the bacteria. The bacteria had evidently anticipated the operation by at least four inches, for the amputation was performed two inches above the elbow, and this was two inches above the diseased area.

Dr. SULLIVAN asked if Dr. Robb was certain about the catgut having been thoroughly sterilised. Of course, the low vitality of the patient must have much to do with such a case, for certainly a fatal result was comparatively rare under these circumstances. An ordinarily healthy person ought to have sufficient vitality to hold the pus germs in abeyance for three or four hours. The best treatment he had seen for such infected wounds was "the bath treatment," that is keeping the limb continually in a bath of a hot antiseptic solution, such as carbolic acid solution or naphtholin solution. The worst case of the kind he had ever seen recover was one in which the limb was kept in a bath of water night and day, and the water maintained at a temperature of about 110° F. Part of the time a solution of naphthol was used.

Dr. CHARLES A. CHURCH, of Essex county, recalled a case he had seen of a man who had received an injury to his toe from an axe. Although believing it very doubtful that the toe could be saved, the patient was so urgent about it that he was tempted, against his judgment, to save the member. Every possible antiseptic precaution was taken, but on the second day there was an elevation of temperature accompanied by pain, and on removing the dressings it was found that the toe had turned black, and that there was considerable cellular inflammation extending up to the ankle. The toe was at once amputated, saving the ball of the foot. The whole foot was enveloped in bichloride gauze wrung out of one to four thousand bichloride of mercury solution, and instructions were given that this solution should be applied night and day. This was practically the same as the bath, and was more convenient. In two days from that time the inflammation had all subsided, and although the tissues were so unhealthy, union by first intention was secured.

Dr. E. D. FERGUSON said it seemed to him that the weak point in the case described in the paper was the catgut ligature. It was certainly convenient to use catgut prepared by others, but this was so notoriously unsafe that he thought we should personally superintend its preparation. It was very difficult to make it aseptic, and keep it so; it could be done only by such careful, conscientious care as was likely to be given by the surgeon himself.

Regarding the application of a large amount of cloth in any dressing, and the continued application of such solutions as bichloride and carbolic acid, he would say that if the dressing were to be changed with each fresh application of the antiseptic fluid the plan was all right; but it should be remembered that the water would evaporate and leave the material, originally held in solution, in the dressing, thus giving a con-

stantly increasing strength to the application. He had seen vesicant and corrosive effects from applications of corrosive sublimate made in this way, and also a number of instances of gangrene of the finger from applications of a four per cent. solution of carbolic acid to a simple cut for a number of days until the solution had become too concentrated.

Dr. Z. J. Lusk said he quite agreed with Dr. Ferguson in his remarks. All knew the usual condition of railway wounds when first seen by a surgeon, and yet it was comparatively rare to get cellulitis; hence something more seemed to be necessary to explain the fatal result in the case described in the paper.

Dr. Cronyn said he believed that the surgeon very seldom noticed the absorption of carbolic acid to such an extent as to cause albuminuria with its consequences. He had seen entire suppression of urine for twenty-four hours from the absorption of a very small quantity of carbolic acid. This injury to the kidney was entirely too common.

He did not think the sulphides were used sufficiently often in cases of suppuration. This was a point better understood by the general practitioner than by the surgeon.

Dr. Robb said that the catgut had been prepared by Seabury & Johnson, and that he had used the very same sample of catgut ligatures both before and after the case under discussion, and without any bad results, so he did not think the catgut was septic. The urine was examined repeatedly before the operation, and there had been no evidence of renal disease.

DIET AND REGIMEN FOR THE DIMINUTION OF FAT.

By T. J. McGillicuddy, of New York County.

Read by title October 10, 1894.

Corpulence may be decreased by excluding from the diet all fatty foods or those that are converted into fat, such as sugar and farinaceous foods, bread, potatoes, beets, parsnips, carrots, turnips, rice, hominy, beans, peas, and substituting in a measure spinach, celery, tomatoes, lettuce, cauliflower, greens, cabbage free from stems, buttermilk, skimmed milk, oysters, eggs, and meat, except pork or veal. All vegetables grown under ground should be avoided.

A lean meat diet is essential in this disease, but it must be properly prepared, otherwise the patient will soon get disgusted and abandon it. Properly prepared and in proper quantities it can be readily taken for long periods with a relish. The meat should be lean and juicy, and from the centre of the round.

After all the fat and fibre has been removed, it should be cut into small pieces, and passed twice through a perfectly clean chopper; or it may be scraped from the fibrous tissue with a knife or meat scraper, or chopped on the block by the butcher. The pulp should now be pressed very gently into cakes from one half to three fourths of an inch in thickness. The cakes should then be very carefully broiled over a clear coal fire, or over one free from smoke or blaze, and they should be turned frequently to retain their juice. If desirable, they can be seasoned with a little salt or pepper.

Another method of cooking the beef pulp is to gently simmer it with a small quantity of water upon the back of the stove for about fifteen or twenty minutes. It should not be

allowed to boil as this coagulates the albumen and makes it difficult of digestion.

Breakfast.—Four or five ounces of chopped beef, chicken, mutton or game, or broiled white fish. One large cup of weak tea without milk or sugar.

Dinner.—Five or six ounces of any white fish except herring or eels; any kind of poultry or game; any meat except pork or veal; a biscuit or a slice of stale bread; a tablespoonful of Liquid Peptonoids in water.

Supper.—Three or four ounces of chopped beef, chicken, and two small slices of stale bread. Drink a pint of hot spring water (sipped at intervals) every two hours. As a laxative, when needed, a wineglassful of senna tea with a little fennel added, may be taken.

Frequent bathing, especially Turkish baths, accompanied by vigorous massage, walking, exercise, or bicycle riding, must be taken. Large quantities of fresh air should be inhaled to oxidise the excess of fat which the hot water then eliminates.

With the above is combined the medical treatment, consisting of the chlorate and iodide of potassium as oxidisers—and such other remedies as are indicated and usually prescribed.

The physicians should make such modifications in the diet as the condition of the patient requires.

Much of the food eaten not being digested, undergoes fermentation, evolving yeast, carbonic acid gas, vinegar, or alcohol. Instead of nourishing the body, a catarrhal state of the digestive organs is the result of this fermentation, and a diseased condition of the tissues of the body supervenes.

In perfect health the normal amount of adipose tissue should not exceed five per cent. of the total weight of the body. Obesity is due usually to defective oxidation of the excess of food taken, and of the waste of the body generally. It is a diseased process resulting from eating to excess all kinds of food, and especially those that form fat. Excessive use of alcoholic beverages, and lack of exercise in the open air, are also great factors in its production. It is simply the outcome of wrong physical habits, and especially improper alimentation. The difficulty of breathing, the great enlarge-

ment of the body, and interference with easy movement, are the principal symptoms which attract the attention in this condition.

The cure of this disease is safe and rather simple by a rigid adherence to a proper dietary. In a comparatively short time, as a result of the treatment, the digestive organs are restored to a healthy state. In a very extensive experience during the last ten years with this plan of treatment, I have seen that when honestly carried out as advised, it has usually been successful, and has never been productive of anything but good to the patient as it is based upon scientific principles.

Special feeding is here indicated by the condition of the system, and acts as a means of cure in this disease, which has, as a rule, resulted from unhealthy feeding.

The hot water should be carefully taken, as advised, as it is a most important part of this method of treatment. The following are some of the reasons for the use of the hot water:

Taken as directed it is said to cleanse the stomach and small intestines of the excess of catarrhal mucus which interferes with digestion, and also to diminish its formation. It assists in removing any remnants of the preceding meal, and gives these organs a chance to rest and recuperate for work on the next meal. It subdues inflammation of the mucous membrane, the same as a poultice does. It is a stimulant to the central nervous system, and by reflex action, the secretion of gastric juice is increased. It stimulates the vermicular movements of the digestive tube. It is a safe and efficient liver stimulant, increasing the flow of bile and improving its quality. It purifies the lymph channels of the body, removing the irritating products of fermentation which have been absorbed from a catarrhal digestive tract. It is a digestive stimulant, as it stimulates the portal or digestive circulation, and by increasing the volume of the circulating fluid is a heart stimulant and tonic also.

It increases the urinary flow, and elimination of the waste

of the body, thus increasing the room for nourishment. It frequently induces sound and refreshing sleep by subduing reflex irritations. The hot water is best taken on an empty stomach, about an hour before meals, and half an hour before retiring; but it may be taken at any time. It should be quite hot, but still of a comfortable temperature—anywhere between 110° and 130° Fahr., and not simply warm, as warm water nauseates. It may be slightly disagreeable to take at first, but one soon gets accustomed to it. A pinch of salt or a few drops of lemon juice may be added, if desired. Many physicians advise almost a complete abstention from liquids but it seems to me that this is a dangerous procedure and liable from the non-elimination of the poisonous waste of the body to cause arterial and renal disease.

Where digestion and assimilation are much interfered with, as in this disease, the diet of ground or chopped beef is indicated, it being very easy of digestion and assimilation. It is rapidly absorbed, and enriches the blood, which is always in this disease deficient in the oxygen carriers (the red blood corpuscles). Carefully broiled tender steak is nearly as useful as the ground beef, but it should be well masticated. Although it is not a fattening diet, it is very strengthening, making the weak happier and more comfortable as a result of their renewed health.

This is a hard diet, and a great deal of self denial and perseverance will be necessary. It is best to eat alone, and not be in the room with company. Thus the temptation to indulge in forbidden articles of food is avoided. If there is a feeling of weakness or insomnia at night, drink a little beef tea, or have a sandwich or cracker at hand. In beginning the treatment, the patient may feel a trifle weaker in body for a day or two, owing to the absence of the products of fermentation, alcohol, etc.; but this is natural, and to be expected. The patient should keep quiet at first and he will rapidly grow strong, and his mind will feel stronger and clearer. There will immediately begin a shrinkage in weight as the diseased fat disappears. Out-of-door exercise should be taken—walk-

ing, bathing, dumb bell exercise for ten minutes, three times daily, three hours after meals. As a rule, all stimulants are forbidden, except as specially ordered by the physician.

Obesity is simply a disease, and must be treated as such. The fat accumulates because it is not oxidised. Alcohol, taken as a beverage and generated in the intestine by fermentation of starchy food, interferes to a marked extent with its oxidation.

Receipts for Cooking the Ground Meat.

Scotch Collops.—One pound of chopped or ground beef, put in a stew pan and add enough cold water to cover the meat; add an onion cut up fine, and a little salt and black pepper. Simmer carefully on the back of the range, (it must not be allowed to boil); add a little sauce free from red pepper shortly before serving, and garnish with small, thin pieces of roasted bread, not too crisp or hard.

The following is another method for cooking the chopped meat, and is very pleasant for a change, and when so prepared, it is easily digested:

Take one pound and a half of chopped or ground beef, one pint of good meat soup, free from fat; simmer carefully over a gentle fire until well cooked. It must not boil, as this coagulates the albumen, interfering with its digestibility, and its value as nourishment. This is more palatable than the beef cakes, even when they are soaked in meat soup before broiling.

A nice dish for a change is to take some stock and a little boiled milk, and add one third bread-crumb to the chopped beef, mixing well together, and making into soft cakes about three quarters of an inch thick.

DISCUSSION ON THE PREVENTION OF TUBERCULOSIS.

I.

THE IMPORTANCE OF TUBERCULOSIS FROM A SANITARY STANDPOINT, AS SHOWN BY ITS PREVALENCE.

II.

THE FACTORS IN THE CAUSATION OF TUBERCULOSIS.

III.

THE COMMUNICABILITY OF TUBERCULOSIS AND THE MANNER OF ITS TRANSMISSION.

IV.

THE EARLY RECOGNITION OF PULMONARY TUBERCULOSIS THROUGH BACTERIOLOGICAL EXAMINATION AND ITS INFLUENCE ON PREVENTION.

V.

THE INFLUENCE AND VALUE OF SPECIAL HOSPITALS FOR THE TREATMENT OF TUBERCULOSIS IN THE PREVENTION OF THE DISEASE.

VI.

THE INFLUENCE OF THE DOCTRINE OF COMMUNICABILITY UPON THE DIMINISHED PREVALENCE OF TUBERCULOSIS.

VII.

THE IMPORTANCE OF MEASURES TO BE TAKEN AT HEALTH RESORTS FOR TUBERCULAR PATIENTS FOR THE PREVENTION OF THIS DISEASE.

VIII.

THE DANGERS OF INFECTION IN THE VARIOUS MEANS OF TRANSPORTATION—STEAMBOATS, SURFACE AND ELEVATED CARS, DAY COACHES AND SLEEPING CARS.

IX.

THE PROPER ATTITUDE OF STATE, MUNICIPAL, AND SANITARY AUTHORITIES TOWARD TUBERCULOSIS, AND THE SPECIFIC MEASURES TO BE TAKEN FOR THE PREVENTION OF THIS DISEASE.

INTRODUCTION TO THE DISCUSSION.

By Hermann M. Biggs, M. D., of New York County.

October 10, 1894.

There is no question with which sanitary authorities have to deal, so far as the management of infectious diseases is concerned, which compares in its importance with that of the prevention of tuberculosis; nor is there any disease in

which efficient sanitary measures seem more likely to be followed by a striking diminution in the mortality. There is no important sanitary question in which the measures in force throughout the world are more defective and inadequate and more out of harmony with the discoveries of modern scientific medicine. Great hesitance and reluctance has been everywhere shown in accepting the inevitable and logical deduction of demonstrated and accepted facts as to the nature and causation of tuberculosis, and nowhere in the field of modern scientific medicine has the influence of tradition and unwarranted conservatism been more tenacious and powerful.

It has, therefore, seemed to the writer that the subject, "The Prevention of Tuberculosis," might with confidence be presented at the annual meeting of this Association for discussion as one worthy of careful consideration, and one the discussion of which was likely to be both full of interest and fruitful in important results. It is not anticipated that any new facts or new phases of the subject can be presented, as the discoveries regarding the nature and causation of this disease are too old and the subject has been too often and too fully gone over to justify such expectation, but the known facts may be presented in new and different forms, the need of proper sanitary measures once more emphasised, and their force increased by repetition.

It is not my purpose to say anything specifically regarding most of the questions which I have had the honour of presenting here for discussion, as these will be fully considered by other speakers who are to follow me, but I desire to outline briefly some of the sanitary aspects of the question, and to define my conception of the standpoint from which it should be considered; I desire also to describe briefly the measures adopted by the New York city health department on my recommendation in the early part of 1894.

In 1882 Koch in a classical communication proved beyond question that tuberculosis was an infectious disease, caused by the tubercle bacillus. These observations have since

been somewhat amplified and repeatedly confirmed. They are generally accepted throughout the world as being absolutely and unreservedly true. Infectious diseases have long been everywhere considered as synonymous with those regarded as preventable. Tuberculosis, being then infectious and preventable, is to be judged as to its sanitary importance by the same standards as are applied to other diseases of this class, *i. e.*, as to its relative frequency and mortality. Judged by this standard tuberculosis ranks easily as first in importance. Its prevalence, its insidious nature and slow progress, its apparent relation to heredity and various economic and humanitarian considerations have and still do blind the eyes of many normally clear sighted medical men to a most extraordinary degree, as to its sanitary aspects.

As judged fairly by demonstrated facts, tuberculosis is due to the tubercle bacillus, and is therefore infectious. It is as certainly and apparently as easily preventable as any other important infectious disease, and the measures directed to the accomplishment of this purpose can be more intelligently applied and with as little real hardship to the sufferer as those having reference to any other.

I do not propose in this introduction to rehearse all the facts leading inevitably and logically to this conclusion, because they have been considered too often to make such a course necessary. I desire, however, to emphasise the importance of the conclusion. The whole problem as it presents itself to me is summarised in the statements, admitted by all, that every case of tuberculosis is the result of infection by tubercle bacilli, derived directly in some way from some other human being or animal suffering from the disease; and that these tubercle bacilli in all cases of acquired tuberculosis are contained in known, definite discharges that can be destroyed. Whatever other factors enter into the problem of causation, the only essential one is the tubercle bacillus. Granted all the influence claimed by the most ardent advocate of hereditary transmission of the tubercle bacilli and inherited predisposition as factors in causation,

yet the problem of acquired tuberculosis still remains the most important sanitary question of the day. When we turn to the consideration of the measures that have been adopted in the various countries and cities of the world, in view of the accepted facts we are astounded by the discovery that almost nothing has been or is being done. Even in Berlin where we have learned to look for our most advanced theoretical work, the sanitary surveillance of this disease differs but little from that in force in 1882; in other words, no measures have been adopted for its prevention. More definite and advanced steps have been taken in New York in the measures designed for the prevention of tuberculosis than in any other city of the world.

The various arguments urged against any official action looking to the general notification of tuberculosis, or the sanitary surveillance of the disease as infectious, seem to me to have but little force or appropriateness.

It is urged that the disease is not readily communicated, for while it may be transmitted from person to person, yet long and constant intercourse is required; that many persons exposed to the disease escape, for even physicians and nurses in consumptive hospitals rarely contract it; that consumptives will be regarded as plague stricken if we call tuberculosis a communicable disease, and that, therefore, the dictates of humanity forbid such action; and finally that in many cases it is inherited and no sanitary interference will prevent such transmission. Many of these arguments might be urged with almost equal force as regards other infectious diseases. No one of them, in my opinion, has any legitimate force. Tuberculosis only results from the introduction into the body of the tubercle bacilli immediately derived from some animal or person suffering from the disease. The bacilli do not multiply outside the living body under natural conditions. Without these bacilli thus derived tuberculosis would soon cease to exist. It does not matter how slowly or insidiously the disease develops, how difficult it may be to trace any case to its source, how long the exposure required,

how favourable the conditions necessary for transmission, or how many persons exposed may escape infection, the fact still remains unaltered that the disease is produced only through infection.

We have here, it seems to me, a simple, concise statement of the only essential facts regarding this disease as judged from a sanitary point of view.

So long ago as 1889 the New York city board of health, at the instance of the medical commissioner, Dr. J. D. Bryant, passed a resolution calling upon the, at that time, consulting pathologists of the department for a report on the causation and prevention of pulmonary tuberculosis. A report was forwarded by the pathologists in compliance with this resolution, and the essential facts as now generally accepted were contained in it. The department took some measures looking towards the study and prevention of the disease at that time. Large numbers of leaflets were printed and distributed, but the education of the profession had not then reached a point advanced enough to justify the department in taking active measures for the repression of the disease. This action of the New York health board, under the direction of Dr. Bryant, in 1889, was, I believe, the first movement of any sanitary board looking toward the sanitary surveillance of tuberculosis.

In the fall of 1893 I had the honour to present another communication to the board, calling attention anew to the sanitary importance of this disease, and recommending that action be immediately taken looking towards its active sanitary surveillance. The specific recommendations contained in this report were adopted by the board of health and were put into force in the early part of the present year. The following extracts are taken from this report:

It follows from what has been said that tuberculosis is a communicable disease, and is distinctly preventable. The means which are the most certain to prevent its spread from one individual to another are those of scrupulous cleanliness regarding the sputum. These means are largely within the control of the affected individual. It should be con-

stantly kept in mind that it is the sputum, and the sputum alone, which is commonly the important agent in its transmission.

It is furthermore to be remembered that consumption is not always, or even generally, as was formerly supposed, a fatal disease, but that in a very large proportion of cases, if recognised early, it is a distinctly curable affection. An individual who is well on the road to recovery may, if he does not with the greatest care destroy his sputum, diminish by self inoculation his chance of recovery.

The following facts should be especially emphasised:

First—That tuberculosis is a communicable disease, and is distinctly preventable.

Second—It is acquired by the direct transmission of the tubercle bacilli from the sick to the well, usually by means of the dried and pulverised sputum floating as dust in the air.

Third—It can be largely prevented by simple and easily applied measures of cleanliness and disinfection.

The time has arrived when the knowledge concerning the causation, extension, and prevention of pulmonary tuberculosis is sufficiently definite to make possible the adoption of important practical measures for its restriction; yet these measures must at present differ in many respects from the more summary proceedings justified in other more readily transmitted diseases, more properly called contagious; for it is to be remembered, that while tuberculosis is always the result of infection, yet it is far less readily communicated than some contagious diseases, and, with proper precautions, victims of this disease may, without endangering others, pursue their usual avocations.

I would therefore recommend:

First—That there be systematically disseminated among the people, by means of circulars, publications, etc., the knowledge that every tubercular person may be a source of actual danger to his associates, and his own chances of recovery may be diminished, if the discharges from the lungs are not immediately destroyed or rendered harmless.

Second—That all public institutions, such as asylums, homes, hospitals, dispensaries, etc., be required to transmit to the board of health the names and addresses of all persons suffering from pulmonary tuberculosis within seven days of the time when such persons first came under observation.

Third—That special inspectors be assigned to duty for the investigation of this disease, and whenever the department has become aware of the existence of families or premises where tuberculosis exists, or has recently existed (as in case of death or removal), it shall be the duty of these inspectors to visit such premises, deliver proper circulars and give suitable information to the persons residing there, and take such specific measures of disinfection as are required in each case.

Fourth—That the board urge upon hospital authorities the importance of separation, so far as possible in the hospitals of this city, of persons suffering from pulmonary tuberculosis from those affected with other

diseases, and urge that proper wards be set apart for the treatment of this disease.

Fifth—That the Department of Charities and Correction of this city be requested to provide a hospital, to be known as "The Consumptive Hospital," to be used for the exclusive treatment of this disease, and that, so far as practicable, all inmates of the various institutions under its care, suffering from tuberculosis, be transferred to this hospital.

Sixth—That the Health Department undertake the bacteriological examination of the sputum for diagnosis in every case of pulmonary disease of doubtful character in private dwellings, boarding-houses, or tenement houses, where the physician in attendance desires that this should be done. This procedure to be carried out with a view of obtaining definite knowledge upon which the proper sanitary surveillance of those suffering from tuberculosis can be based.

Seventh—That all physicians practicing their profession in this city be requested to notify this board of all cases of pulmonary tuberculosis coming under their professional care.

For the proper performance of the preliminary work as detailed above, a special corps of medical inspectors should be provided, whose duties should be entirely confined to work connected with the investigation of tuberculosis and the carrying out of the means to be taken for its prevention.

Finally, in urging the adoption of the recommendations of this report, or some similar ones, I would add that there is, it seems to me, a widespread feeling among the medical profession and the laity that some efficient means should be at once taken to prevent the great and unnecessary loss of human life caused by consumption, and that it is imperative that sanitary authorities adopt such measures as science has shown to be practicable and efficient in controlling the ravages of this disease.

It is my belief that the New York City board of health, which has so often achieved such notable success in the management and control of other infectious diseases, should take the lead in this matter and adopt measures to meet this new and urgent demand upon its resources.

The recommendations contained in this report were adopted, and the following circular was forwarded to every physician living in New York:

CIRCULAR OF INFORMATION TO PHYSICIANS REGARDING THE MEASURES ADOPTED BY THE BOARD OF HEALTH FOR THE PREVENTION OF TUBERCULOSIS.

HEALTH DEPARTMENT,
No. 301 MOTT STREET,
NEW YORK, February 13, 1894.

The communicability of pulmonary tuberculosis has been so thoroughly established, and is now so generally recognised by the medical profession throughout the world, that the Board of Health of New York

City has determined that the time has arrived when active steps should be taken, looking towards its prevention in this city. The Board has therefore resolved to adopt the following preliminary measures:

First—The Department will hereafter register the name, address, sex, and age of every person suffering from tuberculosis in this city, so far as such information can be obtained, and respectfully requests that hereafter all physicians forward such information on the postal cards ordinarily employed for reporting cases of contagious disease. This information will be solely for the use of the Department, and in no case will visits be made to such persons by the inspectors of the Department, nor will the Department assume any sanitary surveillance of such patients, unless the person resides in a tenement-house, boarding-house, or hotel, or unless the attending physician requests that an inspection of the premises be made; and in no case where the person resides in a tenement-house, boarding-house, or hotel will any action be taken if the physician requests that no visits be made by inspectors, and is willing himself to deliver circulars of information, or furnish such equivalent information as is required to prevent the communication of the disease to others.

Second—Where the Department obtains knowledge of the existence of cases of pulmonary consumption residing in tenement-houses, boarding-houses, or hotels (unless the case has been reported by a physician and he requests that no visits be made), inspectors will visit the premises and family, will leave circulars of information, and instruct the person suffering from consumption and the family as to the measures which should be taken to guard against the spread of the disease, and, if it is considered necessary, will make such recommendations for the cleansing or renovation of the apartment as may be required to render it free from infectious matter.

Third—In all cases where it comes to the knowledge of the Department that premises which have been occupied by a consumptive have been vacated by death or removal, an inspector will visit the premises and direct the removal of infected articles, such as carpets, rugs, bedding, etc., for disinfection, and will make such written recommendations to the Board as to the cleansing and renovation of the apartment as may be required. An order embodying these recommendations will then be issued to the owner of the premises, and compliance with this order will be enforced. No other persons than those there residing at the time will be allowed to occupy such apartments until the order of the Board has been complied with. Infected articles, such as carpets, rugs, etc., will be removed by the Department, disinfected and returned, without charge to the owner.

Fourth—For the prevention and treatment of pulmonary tuberculosis it becomes of vital importance that a positive diagnosis shall be made at the earliest possible moment, and that the value of bacteriological examinations of the sputa for this purpose may be at the service of physicians in all cases not under treatment in hospitals, the Department is prepared to make such bacteriological examinations for diagnosis, if samples of the sputa, freshly discharged, are furnished in clean, wide necked, stop-

pered bottles, accompanied by the name, age, sex, and address of the patient, duration of the disease, and the name and address of the attending physician. Bottles for collecting such sputa, with blank forms to be filled in, can be obtained at any of the drug stores now used as stations for the distribution and collection of serum tubes for diphtheria cultures. After the sputum has been obtained, if the bottle, with the accompanying slip filled out, is left at any one of these stations, it will be collected by the Department, examined microscopically, and a report of the examination forwarded to the attending physician free of charge.

Fifth—The authorities of all public institutions, such as hospitals, dispensaries, asylums, prisons, homes, etc., will be required to furnish to the Department the name, sex, age, occupation, and last address of every consumptive coming under observation within seven days of such time.

It is the earnest wish of the Board of Health that all practicing physicians in this city co-operate with the Board in an earnest and determined effort to restrict the ravages of the most prevalent and formidable disease with which we have to deal.

By order of the Board of Health,

CHARLES G. WILSON, *President.*

EMMONS CLARK, *Secretary.*

Large numbers of the following circulars for general distribution were printed in English, German, Italian, and Hebrew:

INFORMATION FOR CONSUMPTIVES AND THOSE LIVING WITH THEM.

HEALTH DEPARTMENT,
No. 301 MOTT STREET,
NEW YORK, February 13, 1894.

Consumption is a disease which can be taken from others and is not simply caused by colds. A cold may make it easier to take the disease. It is usually caused by germs which enter the body with the air breathed. The matter which consumptives cough or spit up contains these germs in great numbers—frequently millions are discharged in a single day. This matter, spit upon the floor, wall, or elsewhere, is apt to dry, become pulverised and float in the air as dust. The dust contains the germs, and thus they enter the body with the air breathed. The breath of a consumptive does not contain the germs and will not produce the disease. A well person catches the disease from a consumptive only by in some way taking in the matter coughed up by the consumptive.

Consumption can often be cured if its nature is recognised early and proper means are taken for its treatment. *In a majority of cases it is not a fatal disease.*

It is not dangerous for other persons to live with a consumptive, if the matter coughed up by the consumptive is at once destroyed. This matter should not be spit upon the floor, carpet, stove, wall, or street, or

anywhere except into a cup kept for that purpose. The cup should contain water, so that the matter may not dry, and should be emptied into the closet at least twice a day and carefully washed with hot water.

Great care should be taken by a consumptive that his hands, face, and clothing do not become soiled by the matter coughed up. If they do become soiled they should be at once washed with hot soap and water. When consumptives are away from home, the matter coughed up may be received on cloths, which should be at once burned on returning home. If handkerchiefs are used (worthless cloths which can be burned are far better) they should be boiled in water by themselves before being washed.

It is better for a consumptive to sleep alone, and his bed-clothing and personal clothing should be boiled and washed separately from the clothing belonging to other people.

Whenever a person is thought to be suffering from consumption, the name and address should be sent at once to the Health Department, on a postal card, with a statement of this fact. A medical inspector from the Health Department will then call and examine the person to see if he has consumption, providing he has no physician, and, if necessary, will give proper directions to prevent others from catching the disease.

Frequently a person suffering from consumption may not only do his usual work without giving the disease to others, but may also get well, if the matter coughed up is properly destroyed.

Rooms that have been occupied by consumptives should be thoroughly cleaned, scrubbed, whitewashed, painted, or papered before they are again occupied. Carpets, rugs, bedding, etc., from rooms which have been occupied by consumptives, should be disinfected. The Health Department should be notified, when they will be sent for, disinfected and returned to the owner free of charge, or, if he so desires, they will be destroyed.

By order of the Board of Health,

CHARLES G. WILSON, *President.*

EMMONS CLARK, *Secretary.*

In the prevention of tuberculosis the following very numerous measures and topics should be considered:

1. Relating to compulsory notification of tuberculosis.

2. Relating to marriage of tubercular patients, and the care of the poor suffering from tuberculosis.

3. Relating to the infectious matter from tubercular patients; (*a*) sputa cups; (*b*) handkerchiefs or cloths for receiving sputa and their destruction or disinfection; (*c*) eating utensils and drinking vessels, especially those in public places; (*d*) the treatment of personal and bed clothing of tubercular patients; (*e*) avoidance of mouth kissing of

tubercular individuals; (*f*) renovation of apartments occupied by tubercular patients; (*g*) exclusion of consumptives from occupations in which they endanger others; (*h*) special hospitals for tuberculosis and regulations for the enforced removal of patients to such hospitals when required.

4. Relating to improvements in the general sanitation of habitations, workshops, factories, etc., as regards (*a*) ventilation, sunlight, drainage, and air space; (*b*) prohibition of back to back houses; (*c*) efficient removal of the dust from or prevention of dusty employments; (*d*) municipal and state regulation and inspection of workshops, factories, composing rooms, etc., as to ventilation, air space, sunlight, plumbing, spittoons, etc.; (*e*) regulation as to width of streets and height of dwellings and air space between.

5. Relating to prophylaxis in those predisposed to the disease; (*a*) measures to prevent exposure to infection; (*b*) removal of children from tubercular parents in poor families; (*c*) measures to develop chest expansion; (*d*) out of door occupations with residence in favourable climate; (*e*) sleeping alone in large, well aired rooms (open windows); (*f*) cold sponge and plunge baths, when tolerated; (*g*) care of catarrhal inflammations of respiratory passages; (*h*) precautions after infectious diseases of childhood; (*i*) maintenance of a high standard of nutrition with a plain, nutritious diet; (*j*) avoidance of close rooms, crowded, badly ventilated buildings, theatres, etc.

6. Relating to the early diagnosis and treatment of tubercular disease; (*a*) bacteriological examination of sputum and use of tuberculin for diagnosis; (*b*) relation of early diagnosis to prognosis and cure of tubercular disease; (*c*) public sanitaria favourably located, for incipient tuberculosis.

7. Relating to governmental inspection of dairy cows (use of tuberculin) and meat intended for food, pasteurisation or sterilisation of milk from suspected or non-inspected sources.

8. Relating to prevention of infection in means of convey-

ance; *i. e.*, street cars, railroad day and sleeping cars, steamboats, steamships, etc.

In New York city, the measures which have been adopted for the prevention of tuberculosis include (1) compulsory notification from institutions; (2) inspection and instruction of living cases in families as to precautions regarding expectoration, etc.; (3) inspection and renovation of apartments when vacated after being occupied by cases of tuberculosis, and instruction of families of dead cases as to dangers and precautions; (4) disinfection of bedding, carpets, etc., from apartments occupied by tubercular patients; (5) free bacteriological examination of sputum in suspected cases for diagnosis; (6) inspection of meat supplies; (7) inspection of lodging houses and tenements, and regulations as to air space, ventilation, etc.

There are still needed in New York city the following measures, which would render more efficient the means taken for the prevention of tuberculosis:

1. General notification.
2. Special hospitals for the care of advanced cases, and free public sanitaria favourably located for the treatment of incipient cases.
3. Inspection of institutions, factories, workshops, composing-rooms, etc., and regulations as to ventilation, air space, cuspidors, cleaning, etc.
4. Registration and inspection of rooms, workshops, etc., where work is done.
5. Regulations for the enforced removal of cases of tuberculosis where required by existing conditions.
6. Inspection of sources of milk-supplies.
7. Regulations as to the precautions to be taken in means of conveyance and their disinfection.

GENERAL DISCUSSION.

Dr. LAWRENCE FLICK, of Philadelphia, continued the discussion, and illustrated his remarks by lantern views. He said that after listening to the able paper of Dr. Biggs he felt that the entire ground had been so ably covered that there was but little left to be said; and if he felt as-

sured that every one would accept what had been said he would refrain from speaking.

Tuberculosis was well known to have been the scourge of the human family as far back as medical history went. Hippocrates spoke of it as epidemic, and lamented his inability to cope with it. Ever since then the medical fathers had laboured under the same inability to cope with the disease. Within the last two centuries it had been possibly even a greater scourge than in ancient times. In the United States the disease did not exist prior to the emigration of Europeans. This was a very strong argument in support of the contagiousness of this disease.

The speaker then showed on the screen the United States maps for 1870 and 1880 to demonstrate that health resorts had been the means of propagating the disease. At that time, the disease of course prevailed mostly in the old centres of habitation. Scarcely one hundred years ago, the states of New York and Pennsylvania were practically free from tuberculosis, and were looked upon by people in Europe as possessing a curative climate. The map for 1880 showed how the disease had spread. California had become one of the banner states for consumption, and Florida was becoming a close second. The map of 1890 showed that North Carolina, which was now a resort for consumptives, was fast assuming the third position in this respect.

Tuberculosis has been laid down as distinct in its etiology from smallpox and other diseases, and the laws governing its prevention must therefore be different. That tuberculosis was a disease of small streets and alleys was shown by a picture of a small blind alley with fifteen or twenty houses on either side of it. He had found these places to be really centres of infection. The next picture showed a sample interior of many small tenements, and the living room both of the well and the sick. He said that he had time and again convinced himself by investigation that it was the home life and associations that were responsible for a very large part of this disease. Yet no matter what was the predisposing element, it was impossible to develop tuberculosis without the tubercle bacilli. While predisposition played a most important part, there was no person immune enough not to contract tuberculosis if exposed persistently night and day to such an environment as he had shown. He had seen some of the finest specimens of humanity, belonging to families having especially good family histories, succumb to such dire influences. Dr. Flick next showed a map which he had made some years ago as a result of a house to house inspection for tuberculosis. It gave all the deaths that had occurred in a certain area of Philadelphia for twenty-five years. It showed that in certain houses the disease had recurred again and again. Dr. Chapin had taken up the same subject, and had found that infection was by no means confined to the lower classes.

The next picture, that of a hospital for consumptives, was shown with the idea of bringing up the subject of the effect of such hospitals on the spread of the disease. The picture represented one of the pioneer hospitals of the old world. These hospitals, without other preventive

measures, had reduced the mortality from tuberculosis nearly fifty per cent. In England alone the hospitals for consumptives had a capacity of nearly seven thousand beds, and since these hospitals had been in vogue there had been a steady reduction of the mortality from tuberculosis. This was certainly a powerful argument, not only for the contagious nature of tuberculosis, but for furnishing better hospital accommodations for this class.

The speaker said that since 1882 the doctrine of the contagiousness of this disease had been pretty generally accepted all over the world, and the effect of the work of the profession without any preventive measures on the part of the governments, had been very salutary. In the city of Philadelphia there had been a reduction of six tenths per cent. in the mortality, or a saving of nearly one thousand lives a year. From the beginning of the system of registration there to the year 1883 there had been practically no reduction in the mortality. At the rate at which the mortality was being reduced, tuberculosis would be wiped out within twenty-five years, without any other measures, and that, too, although Philadelphia was far behind New York in regard to the adoption of special sanitary measures for the prevention of tuberculosis. In Berlin there had been an even more marked reduction in the mortality rate—nearly one third since 1884. In Paris, however, there had been no reduction in the mortality from tuberculosis for the past thirty years; it was still four per thousand. No sanitary measures had been adopted there. In England, with isolation, the mortality had been reduced to a little more than one and a half per thousand. New York was certainly teaching the world a great deal as to the measures necessary for stamping out tuberculosis. He was thoroughly convinced that this happy result would be realised in a short time. The preventive measures introduced into Italy one hundred years ago also illustrated what could be done by such measures. At the time of their introduction the disease was especially rampant there, the mortality being about ten per thousand. It was so malignant that visitors to Italy would write home recommending to others that they should not come there. The kingdom of Naples introduced preventive measures of the most stringent character, but not based upon scientific principles; the only effective element was compulsory isolation. The consumptive was compelled to go to a hospital, or if not, an inventory was taken of everything in his room, and if at his death anything was missing there was a heavy penalty inflicted. This one measure resulted in practically stamping out the disease, and so effectually, that in the extreme southern part of Italy, which was the most influenced by these laws, the mortality at the present day was only about one tenth per thousand in the cities, and practically nothing in the country.

Dr. J. H. Huddleston, of New York county, said that, although the prevalence of tuberculosis was recognised, its exact extent was not yet known. There were some practical obstacles in the way of determining this, as had been shown in the attempt to have cases of tuberculosis

registered in this city. In New York the mortality records were full, but they were inaccurate chiefly from two causes, viz.: (1) there was a certain pardonable omission of the word "tuberculosis," on the death certificate in cases of Pott's disease in which the patient had died of another complaint; and (2) owing to the fact that in the tenement district many persons carried a small life insurance which would be forfeited if the word "tuberculosis" appeared on the death certificate, this was often omitted.

Regarding the routine methods of examining sputum by the health department, he would say that the sputum usually came to the laboratory in a jar, although occasionally it was received dried on a handkerchief or piece of paper. When the urine was the subject of investigation it was filtered, and the residue examined microscopically. In examining the sputum a suitable portion was smeared on a cover glass, and a platinum wire used to spread the sputum on the glass. It was then stained with fuchsin and decolourised with nitric acid, and the contrast-stain made with methylene blue. In every case two cover glasses were examined. If no tubercule bacilli were found, in cases where there was enough sputum, it was concentrated by heating it over a water bath, and the residue was then examined in the same manner. Where there was much sputum, a few drops of a thirty per cent. solution of caustic potash were added before proceeding to stain for tubercule bacilli. In about sixteen per cent. of those cases in which there were no bacilli found without the caustic potash or the concentration, bacilli were found after this process of concentration.

Dr. Joseph D. Bryant, of New York county, said he had been asked to narrate something of the early history of this fight of the health board against tuberculosis. In the year 1887, the health department deemed it wise to institute measures for the purpose of repressing the spread of the disease. At that time the speaker had been the medical commissioner of the health department, and with a view to ascertaining whether or not the profession of this city would look upon the measure as one to which they could give the necessary support, he addressed to twenty-four representative members of that profession in New York city, a letter which was substantially as follows:

Dear Doctor: Believing that the investigations regarding tuberculosis have been extended to that degree which warrants the conclusion that it is a contagious disease and should be met by urgent remedies, I take the liberty of submitting to you the following questions:

1. Do you regard tuberculosis as a contagious disease?
2. In your judgment is the present state of education regarding the disease of sufficient importance to warrant it being declared by the Board of Health as a contagious disease, and the reporting of the same to the Board the same as in the case of other contagious diseases?

While he did not intend to be at all personal, he thought he would be justified in saying that from the great majority of gentlemen he did not receive any reply—not because they were not interested in the subject, but probably because they feared to meddle with the question at that

time, and because many of them were unwilling to acknowledge the belief that was already being expressed among some of the more advanced in the profession. Only two of these gentlemen replied in an unqualified manner—that is "Yes, I regard it as a contagious disease, and I think the Health Department would be justified in demanding a report." One of these favourable replies came from Dr. Austin Flint and the other from Dr. Frank P. Foster, the editor of the *New York Medical Journal.* In this connection he would say that he had received encouraging replies from Dr. Jacobi, Dr. Janeway, and some few others. From one of the leading physicians of this city he had received this reply: "No. It is not contagious, and I do not think it concerns the board of health." He spoke of this only to show the great improvement that had taken place since 1887. Now the entire profession was hand in hand with the board of health.

After this experience he sent a communication to the registrar of vital statistics, Dr. Nagle, asking him to report to Dr. Cyrus Edson every case in which death appeared to be due to tuberculosis, and to ascertain by inspection whether or not there had been any previous disease, and whether proper care was being taken by the people in accordance with a circular sent out by the board. He made up his mind that if he could get definite data in this way he would induce the board of health to pass a resolution to the effect that tuberculosis was a contagious disease. But after two years or more of this observation, the gentleman having charge of this work could not assure him that he had found the proper evidence, so nothing was done about it.

In his judgment there was much to be thankful for when a city was threatened with an epidemic. He regarded the presence of cholera recently in New York as being one of the most fortuitous circumstances which had occurred in this city, for it had improved our means for fighting contagious diseases. It had certainly enabled the health commissioners to call for money which was expended in establishing and carrying on the bureau in which Dr. Biggs was now doing some excellent work.

IX.

THE PROPER ATTITUDE OF STATE, MUNICIPAL, AND SANITARY AUTHORITIES TOWARD TUBERCULOSIS, AND THE SPECIFIC MEASURES TO BE TAKEN FOR THE PREVENTION OF THIS DISEASE.

By E. K. Dunham, M. D., of New York County.

In the light of our present knowledge of tuberculosis there can be no question in my opinion that the state and municipal sanitary authorities must accept the view that the disease is infectious and communicable. If that be so the logic of the situation would class tuberculosis among those diseases which it is the duty of those authorities to consider preventable. It therefore devolves upon them to consider what means they should employ to prevent or mitigate the chances of infection. In studying this problem they must first inquire into the sources of infection to which the community is exposed, and then consider what means can be employed to suppress those sources with the least possible hardship to individuals.

Fortunately the difficulties of these questions are not so great in the case of tuberculosis as they are when the other infectious diseases are considered, because the causation of the disease is better understood, and the appropriate measures more easily deduced from the facts that are at our command.

The chief sources of infection appear to be, (1) tuberculosis in the lower animals, especially cattle, and (2) the discharges from existing cases of human tuberculosis. Compared with these two great sources of infection all other sources sink into insignificance.

Bovine tuberculosis can be dealt with by destroying cattle which are known to be infected, and a ready means of making sure of the fact that they are infected is given us in the employment of injections of tuberculin for diagnostic purposes. It seems to me that the inspection of cattle, including the tuberculin test, naturally falls to the lot of the state sanitary authorities. There can be no doubt that its rigid enforcement would involve the destruction of a large number of cattle. This is unfortunate, as it brings the whole subject into intimate relations with commercial interests, but it is the result of circumstances, and is a condition which it appears to me must be faced. It does not seem equitable that the whole loss of the cattle should fall upon the owners of the animals. The losses following the first inspection, it seems to me, might fairly fall, at least in great measure, upon the community which is responsible for imposing this burden upon the owners of cattle. It does seem right, however, that the losses incurred as the result of subsequent inspections should fall upon those owning the animals, as they would by that time have been educated, and furnished with a means of protecting themselves.

In the case of human tuberculosis, there appears to be no reason to believe that a given case can become a source of infection until the discharges have become the bearers of the parasite which is the cause of the disease. When a case has reached that stage it should properly come within the cognisance of the local health authorities, and be submitted to such regulations as seem best calculated to prevent a dissemination of the parasites without curtailing the liberty of the individual more than the necessities of the case demand. It seems to me that this could be accomplished without classing the disease with such acute contagious diseases as small pox or diphtheria. All that the health authorities need insist upon is the destruction of the discharges which have been demonstrated in that particular case to contain the parasitic organisms.

In the cases of individuals suffering from tuberculosis who

are under the care of their family practitioners, the regulations required by the health authorities might be made to bear upon the individuals through the medium of their own physicians. It seems to me that the facts and necessities of the case are so patent that all physicians of good standing would be willing to coöperate with the local authorities in the establishment of such regulations as to the destruction of the dangerous discharges as would prove efficient without inflicting hardship upon the sick or their immediate associates. Such physicians would be ready to report their suspected cases of tuberculosis to the local health authorities, provided the latter would aid in establishing the fact that the tubercle bacillus was present in the suspected discharges. It seems to me that the local health authorities might insist upon this degree of coöperation from physicians, a penalty being imposed for all cases of death from tuberculosis which had not been promptly reported during the life of the patient. In the case of paupers afflicted with tuberculosis, the problem before the health authorities would be still simpler as the cases, being under the care of the public, could readily be directly looked after in hospitals or wards set aside for their treatment.

Where fatal cases of tuberculosis have occurred, or where patients suffering from the disease have been removed, the premises occupied by them should be so cleansed as to remove the chances of danger to subsequent occupants.

GENERAL DISCUSSION.

Dr. WILLIAM H. PARK, of New York county, spoke regarding the communicability of consumption. He said that only two days ago a friend of his, and a good physician, asked him if he really thought consumption was due to the tubercle bacillus, or whether the tubercle bacillus was due to consumption. If we believed that the tubercle bacillus caused tuberculosis, then the fact of its communicability was established. If we injected a guinea pig with milk infected with tuberculosis, and found tuberculosis rapidly developing in the animal, it would be fair to assume that the bacilli caused the tuberculosis. Those who did not believe in the bacillus should be referred to clinical records. Not long ago a girl came to a throat clinic with laryngeal tuberculosis, and

with signs in the apex of one lung. She stated that a few weeks before, while apparently in good health, she had gone to visit a patient suffering from consumption. She had roomed with that patient, and had slept in the same bed with this tubercular girl, who died soon after. It would seem fair to assume that in this case the disease was communicated to the second girl. He had been told that a few years ago pulmonary consumption had been very rare in Georgia, but that since tubercular cases had been sent there for a change of climate the disease had become more and more prevalent. Here, again, it would seem fair to assume that the disease had been communicated from one person to another. There were two good reasons why the board of health should be notified of all cases of tuberculosis: (1) to enlighten the patient; and (2) to enable the board to study the localities infected and the best methods of preventing the disease. The majority of people in large cities were tenement-house people, who saw very little of medical men, and who were badly in need of education on such matters. We naturally sympathised with a young person stricken down with tuberculosis, yet if we did not endeavour by the best means at our command to prevent the spread of the disease, we would soon be called to sympathise with many others similarly affected as a result of our negligence. It was not uncommon in dispensaries to find patients who were willing and often desirous to go to a hospital, and yet no place but a general hospital was provided for them. For the safety of the people these tubercular patients should be removed to a special hospital for consumptives.

NOTES ON THE DISCUSSION.

By E. G. Janeway, M. D., of New York County.

The consideration of the communicability of tuberculosis, including phthisis, of the cause of this, and of the measures to be adopted to prevent the spread of the disease, is of great interest. My attention was drawn to the possibility of this communicability of phthisis fully twenty years ago, and in 1882 I wrote an article based on a number of cases which I had met for Seguin's "Archives of Medicine," arguing in favor of this contagiousness. There had been a certain number, both of the laity and of the medical profession, who held this belief. It required, however, the work of Koch, and the proof which he adduced that a bacillus was the true cause of tuberculosis and of tubercular phthisis, to produce that widespread acceptance of this doctrine which we now meet, even in the case of those who formerly combatted strenuously this view.

With the belief in the communicability of the disease held for years become grounded by Koch's discovery and work, I have endeavoured to protect, so far as possible, others from the contagion of the disease, by advice to the invalid or his friends, as to the disposition of the sputa and excretions when necessary.

In a short address to the county association a year ago on the dangers of overcrowding, I drew attention to the prevalence of phthisis, the disproportion in New York as contrasted with Philadelphia, and the singular fact which I found in studying the statistics for each of ten years then past, that in each city in proportion to population there had been a decrease in the number of those dying of consumption in the last of the series contrasted with the first. I pointed out the fact that taking all possible causes into account it seemed to prove that attention to disinfection and

destruction of sputum, etc., had already produced favourable results, notwithstanding the imperfect manner of its performance. The hope was expressed that some one would go over the statistics of other cities, and there find the same favourable showing, and that subsequent analysis of the statistics of our own and other cities would show that this apparently favourable showing was no *ignis fatuus*.

It would in my judgment be futile to consider the bacillus alone as responsible for the spread of phthisis. That it is the prime factor seems to the writer as indicated without doubt. But many must be subjected to its influence without falling victims to its destructive tendencies. Moreover, we must discover the cause for the difference in amount of the disease notably as between New York and Philadelphia, the one city overcrowded, too densely populated, and the other spread out over a much larger area. We must never lose sight of the necessity of maintaining at the highest possible point civic and individual hygiene, in order that we may increase the resistance of the individual to noxious agencies, tubercle bacillus included, notwithstanding we consider the bacillus as the cause of tuberculosis, and *pro tanto*, of phthisis. We must all regret that overcrowding in New York, increasing each year, called a necessity, compelling twenty families to live on a lot 25 feet by 100. This must operate in two ways to increase the spread of tuberculosis: First, by bringing more people into close contact with one affected; and second, by diminution of the individual resistance. The writer will briefly state his views on a few of the propositions before us for discussion.

Single examinations of the sputum of patients suspected of tuberculosis may be misleading, and a single negative should not be relied on as disproving the existence of tuberculosis. Moreover, some patients may have advanced phthisis without the history of any expectoration, even in adult life, because of the sputum being swallowed and not ejected. Succeeding negative examinations have been found of great assistance, where bloody expectoration existed with febrile

history and evidences of local trouble in the lungs by physical signs, in excluding phthisis. Miliary tuberculosis may exist without bacilli being found in the sputum. No sputum may be obtainable from a patient having, or suspected of having, tubercular trouble in the lungs. Mistakes may occur to careless examiners, and by want of care in the collection or transmission of sputum or other excretion.

There are no arguments against the importance of the examination for the bacillus in cases of suspected tuberculosis, but for more care and greater accuracy on the part of those examining. More particularly would this be the case where the comfort of the individual might depend on the finding.

That health resorts may become a source of danger as regards the spread of tuberculosis must be evident in view of our belief in the communicability through the agency of the bacillus of the disease.

Many invalids are so cleanly and take such precautions that from them no great danger is to be apprehended. But the case is different when we consider the careless individual, especially in the advanced stage of the disease. The liability is, then, that some of the expectoration will remain on carpets, walls, or on the bed-covering, and if the next occupant of the room should be delicate or convalescent from some other disease, unless the landlord were exceptionally particular as regards the cleansing of the room, might receive enough of the bacilli in the dust of the room to cause tuberculosis.

It has seemed to me in consequence desirable that in hotels at such health resorts as receive a number of phthisical patients there should be set apart certain rooms whose walls should be hard finished, whose floors should be covered with something admitting of washing, as linoleum, for illustration, and whose bedding should be so marked as to make it impossible to put it in the other rooms. To these rooms phthisical patients, especially those having any expectoration, should be assigned. Moreover, a landlord should always notify a guest

of the condition of the previous occupant of a room. This, however, from what I have seen, is practically impossible. Hence my suggestion as to separate rooms for these guests, of particular construction. Better still would be detached houses. Again, great care of the bedding should be required. Blankets, comforters, etc., are probably rarely cleansed in some of the hotels. These would deserve special consideration in order that they may be so covered by sheets that they will not be exposed to the liability to have the sputum dry on them. This could be accomplished by having each such covering in the rooms occupied by phthisical patients protected by a sheet covering not removable by the guest, yet capable of being taken off and washed. This suggests another thought with reference to the washing of woolen underclothing as well as bedding, that in the fear of shrinkage it must often be insufficient from a hygienic standpoint.

It seems to me also desirable that the landlords at hotels of the description I have mentioned should have printed rules directing guests as to the matter of expectoration in accordance with the present standpoint of preventive medicine, and should require from their guests the observance of these rules under penalty of being sent away. Landlords should be compelled to thoroughly cleanse a room occupied by an invalid prior to its occupancy by another person. As to the use of the tumbler associated with the water pitcher or water in most hotels, the people should be educated not to drink from it, or else to cleanse the rim, and put it against the outside of the lower lip instead of against the mucous membrane when unable to use another drinking glass.

In the endeavour to combat the spread of tuberculosis the attitude of the authorities should be that which, while recognising the communicable nature of the disease, should allow the greatest liberty to the person affected by the disease compatible with the welfare of others. It has often seemed to the writer that measures which would be prohibitory of expectoration of all kinds except into proper vessels, which should be placed in all factories, stores, public places, ferry

boats, etc., or carried by the individual, or upon such material which could afterwards be destroyed, would accomplish more than any other to prevent the spread of tuberculosis.

But slow education by the authorities on this matter will eventually accomplish what we would like to see obtain at once, but believe to be incapable of attaining through prohibition of expectoration because such law would not be capable of being carried out. As far as possible the authorities should act through the physicians in charge of patients with the disease in the promulgation of rules to be carried out by the patient. It is, however, unavoidable that there should be laws which will secure in all places of public meeting, and of travel, in factories, postoffices, etc., through the character of the floor and its covering, and the measures of cleanliness, enforced prevention of dust bearing bacilli. As health authorities alone have power to enforce sanitary laws, such rules as have been adopted by the board of health with relation to tuberculosis seem to me reasonable.

If each physician would, by his advice, aid the health authorities in the contest, not alone prescribe for the patient, but also inculcate the laws of prevention, much advance would take place. Experience, however, convinces me that many, in the hurry of practice, are forgetful in this respect.

GENERAL DISCUSSION.

Dr. JOHN G. TRUAX, of New York county, said that he heartily agreed with the previous speakers in almost all that had been said, but it seemed to him that one thing had been forgotten, and that was the duty of the board of health to the profession. We had been told what was our duty to the board of health and to the public, but he thought that when the physician took the trouble to collect sputum for examination, he should receive a report as to whether the tubercle bacilli had been found in the sputum. This would greatly encourage the profession to coöperate with the board of health.

Dr. Biggs had suggested that where there was a doubt as to the existence of phthisis, tuberculin should be used. His experience with the use of tuberculin had not been very great, but it had seemed to him that while it aided in making the diagnosis, it had also hastened the death of the patient. He mentioned this because he wished for information regarding the experience of others on this point.

Dr. Biggs, in closing the discussion, said that he wished to express his personal gratification that Dr. Flick had been able to be present, for it was well known that he had contributed more to the literature of the prevention of tuberculosis than any other man in this country, and that he had been among the foremost in insisting that sanitary authorities should take energetic action regarding the prevention of this disease. Unfortunately, Philadelphia was too conservative to lead in such matters, or the first work in this direction would have been done in Philadelphia rather than in New York, as Dr. Flick had been working on the subject for many years.

In reply to Dr. Truax's criticism, he would say that it had always been the custom of the department to report the result of the examination of sputum sent to him, and the only condition imposed was that the name and address of the patient should be given. It did not seem fair to him that they should do the work unless there was reciprocity.

In regard to tuberculin he would say that during last summer in Berlin he had had a long conversation with Professor Koch regarding tuberculin, and the latter had assured him that he had used it in several thousand cases in the hospital in Berlin, and that it was used as a routine measure in all cases admitted to the hospital in which there was not well defined tuberculosis. If there were well defined physical signs, or if there were tubercle bacilli in the sputum, it was not employed; but it was employed in all other cases, and where properly used he had never found it followed by unfavourable or unfortunate results. Further than this, he said for the treatment of *pure* tuberculosis he believed it to be of inestimable service. It was not to be used in cases of mixed infection where there were septic microörganisms, such as the influenza bacillus, or the pneumococcus of Fraenkel. They distinguished there sharply between these two conditions, as we did between tuberculosis and pneumonia. Tuberculin, given in minute doses, in pure tuberculosis, Professor Koch said, if continued for a long period would almost invariably give a cure. The speaker said that there could be no question that the unfortunate results which had followed the use of tuberculin, had been due to the fact that it had not been used in properly selected cases. If used in cases where there was already a bronchopneumonia or a pneumonic process due to other microörganisms, it excited an additional inflammatory disturbance, and was likely to cause an extension of the process. It did not have this effect, however, in pure tuberculosis. Professor Koch had stated distinctly that he thought it was not only of no use, but was positively harmful in cases of mixed infection. These cases of mixed infection had only been very recently separated from cases of pure tuberculosis, and this explained the unfortunate results first observed in the treatment of tuberculosis with tuberculin.

SOME RECENT STUDIES ON THE COMMUNICABILITY AND TREATMENT OF DIPHTHERIA AND PSEUDO-DIPHTHERIA.

By Wm. Hallock Park, M. D., New York County.

October 9, 1894.

The work of the health department of New York city upon diphtheria is probably known to you all.

The report of the first year's bacteriological examinations of all suspected cases of diphtheria occurring in the city has just been published in the *New York Medical Record* of September 13 and 27.

The health department, largely owing to the influence of Dr. Bryant and of Dr. Biggs, undertook, as you all know, in May, 1893, to make bacteriological examinations in all cases of suspected diphtheria occurring in New York city.

The inoculations of the cultures were made either by the attending physicians or by the medical inspectors of the health department.

The results of over ten thousand examinations have shown that the less marked cases of true diphtheria are very frequently indistinguishable from cases of pseudo or false diphtheria.

These examinations have demonstrated what we all have believed from clinical observations,—that well marked cases of pseudo-membranous inflammation of the upper air passages which give the appearances recognised as characteristic of diphtheria are indeed cases of true diphtheria. These cases are always due to the diphtheria bacilli.

It is not absolutely necessary to make cultures in such well marked cases, and yet as a routine it is well to make them in all cases unless there are important reasons for not doing so.

Perhaps an even more important matter than the making of the original cultures for diagnosis, is their employment in convalescent and infected persons. It has been shown that although the virulent bacilli remain in the throat on the average but seven days, yet in some throats they remain for from two to six weeks.

Further it is found that persons who have been in close contact with diphtheria are apt to take the bacilli into their throats and that these germs may then develop and abide in the mucus, just as they do in some of the convalescent throats. These persons may or may not develop diphtheria at a later period.

When these convalescent cases and these persons who have been in contact with diphtheria contain in their throat secretions virulent diphtheria bacilli, they are very apt to spread the disease. Like the mild cases, they go about unsuspected and thus become all the more dangerous.

In view of these facts the board of health had a resolution passed of which the effect was as follows: All persons who have had diphtheria must remain isolated until cultures have proven their throat secretion to be free of diphtheria bacilli. Also that when the patient has became convalescent, cultures are to be made from the nurse, or from any others who have been in close contact with the case of diphtheria. If these persons are found to carry the bacilli in their throat secretions they are to be treated as the convalescent cases.

In no case can the children be sent to school or the placard be removed from the apartment until all members of the family are free from the diphtheria bacilli.

In order to show that the dangers of allowing mild and convalescent cases of diphtheria to mingle with healthy persons are real, I will give, rather fully, the history of the outbreak of several epidemics which have not before been made public.

The history of an epidemic of diphtheria which started on Fisher's Island a year ago last summer is so instructive in showing how unrecognised and convalescent cases started the

disease, that I ask your attention to it. For many of the details I am indebted to my friend, Dr. H. M. Painter.

From a number of the later cases I had cultures, so that besides the clear clinical evidence the nature of the cases was confirmed by bacteriological examinations.

Fisher's Island lies between the eastern end of Long Island and Connecticut, and is a summer resort. At the time of the epidemic perhaps one thousand people were on the Island.

On Wednesday in the last week in August, a seven-year-old boy, and, a day later, his mother, who were living in an isolated cottage, were taken sick with what seemed to be a simple, well-marked tonsilitis. A day later a young man living in one of a cluster of cottages, the inmates of which ate at a common table, developed a severe croupous tonsilitis, which would be suspected to be diphtheria if that disease were prevalent.

There was now a lull for three days, when suddenly in one day fifteen cases of well marked tonsilitis and half a dozen slighter sore throats developed. The day before a severe storm had swept the island. In another day some of these cases began to look like true diphtheria, and the patients were quarantined. After this day's outbreak only six further cases developed on the island.

These twenty-five cases of undoubted diphtheria and half a dozen of a more doubtful character developed in eight separated cottages or groups of cottages.

More instructive still than the outbreak on the Island are the epidemics started in other places by the scattering summer residents. In the following cases I ask your especial attention to the danger of sending away or receiving persons from diphtheria households.

Among the group of cottages where the chief outbreak of diphtheria occurred was a family in which one child was attacked with the disease, who afterwards died. As soon as the case was considered to be diphtheria, the nurse and another child were sent home to a town in New Jersey. On the way home the nurse complained of a slight sore throat but

no attention was paid to it. Several days later the young child developed diphtheria, and from these cases twenty-four others developed in the town.

The town authorities had the sanitary conditions thoroughly investigated by a sanitary engineer, but although in some of the houses the sanitation was faulty, in others there was nothing to complain of.

From one of the isolated cottages, a mother, a nurse, and two children left the island for their home on the mainland at the time of the outbreak before its nature was suspected. The nurse complained of a sore throat and when home developed diphtheria. Being in a physician's family the nurse was carefully isolated. After recovery everything which had been in contact with her was burned or disinfected. Ten days after she returned to the care of the children, and three days later the eldest child contracted diphtheria and died. Notice that here a person who was supposed to have entirely recovered still carried infection.

In another cottage on the island, after diphtheria had broken out, a grandmother with one of the children returned home to New Haven, developed diphtheria, and died. This was the origin of other cases.

A young man, who was mentioned as coming to the cottages ill on the day of the first cases, returned home three days later and died of diphtheria.

It may be stated that although the drainage and sanitary conditions on the Island were not at that time first-rate, yet they were no worse than other resorts, and to them could not be attributed the outbreak. In the year since then but two cases have occurred on the Island.

In order to emphasise certain important points, I will ask your attention to two other slight epidemics in this city.

For the particulars in this first epidemic, I have to thank Dr. Arnot Spence. Cultures from all the cases were examined in the laboratory of the health department, and contained diphtheria bacilli.

In a family on the west side, Case One of diphtheria occurred, the origin of which is unknown. This child visited Case Two against the orders of the health department, since diphtheria bacilli were still present in the throat. Three days after this visit, Case Two, living in another house, showed a discharge from the nose and in several days developed severe tonsillar diphtheria. The mother of this child, who attended her, and the three-year-old brother, who persisted in running in and out of the room, did not develop diphtheria, but a relative's child, Case Three, which was with them up to the day the child became sick, developed diphtheria and later its mother, Case Four. Case Three died, Case Four recovered. All through her sickness the mother, Case Four, nursed a baby, who did not take the disease; nor did other members of the family.

Case Two, the day before being taken ill, took care of a little baby in an apartment across the hall. This child, aged two months, Case Five, developed a nasal discharge and later a suspicion of psuedo-membrane in the nose. In this nasal secretion the bacilli had persisted up to the present time,—five weeks. Four days after the bacilli were found in the nasal secretion of Case Five, the mother who nursed the baby, developed extensive membrane but only slight constitutional symptoms.

The second epidemic I will but touch on.

In one of the department districts a tenement became infected. In the course of the month, five out of the eighteen families had cases of diphtheria. Investigation by Dr. Lynde showed that four of the five families were related to each other. Cultures from the throats of the mothers showed two of them to contain abundant bacilli. The more frequent communication of the individuals of these families was clearly the reason why they and not the other families became the seat of the disease.

I could go on with many other examples, showing how convalescent cases or persons from infected households carrying the germs of diphtheria, have been the origin of new cases

in distant places, they, themselves, sometimes developing diphtheria, sometimes not.

A very important question in dealing with cases of suspected diphtheria is the degree of isolation which should be enforced in cases proven not to be true diphtheria.

TREATMENT OF DIPHTHERIA.

Remedies locally applied to destroy the diphtheria bacilli and the other associated organisms:

In a limited series of experiments at the Willard-Parker hospital, it was attempted to thoroughly disinfect the throat by very frequent irrigation with bichloride 1-3,000 solution and solutions of peroxide of hydrogen of varying strength. It was found impossible to disinfect the mucous membranes completely. In some the diphtheria bacilli persisted, in others they quickly disappeared. In all, the streptococci persisted in spite of the antiseptic douching.

A long series of experiments were then tried by Dr. White and Dr. Somerset, the resident physicians, at the hospital. The diphtheria cases were divided into three sets: One treated locally by frequent nasal and throat irrigation of lukewarm, salt water solution; the second by bichloride of mercury 1-4,000 in nose, 1-2,500 in throat every four hours, and the other by five to twenty-five volumes per cent. of peroxide of hydrogen as a spray. The cases receiving the peroxide and bichloride treatment were also treated at times with the salt water irrigation. In all about eighty cases were treated, and, as far as Dr. White could see, with about equally good results. All cases admitted to the hospital with the exception of laryngeal cases were treated.

The diphtheria bacilli disappeared a little more quickly in the cases irrigated with the bichloride solution. In the eighty cases there were but five deaths.

More detailed accounts of these experiments I hope will be given us by Dr. White, resident physician to the Willard-Parker hospital.

From my observation of cases treated at the diphtheria hospital as well as at other places, I should say that the cleaning by irrigation of nasal, post nasal, and pharyngeal cavities frequently repeated was the essential thing. The nature of the fluid used, whether a solution of salt water, bichloride of mercury, or peroxide of hydrogen, was less important. Personally, I prefer to use, several times a day, a solution of bichloride of mercury, 1-4,000, and between times salt water. Peroxide should not be used in the nostrils in strong solutions, as it is irritating. It does better in the throat than in the nose.

For laryngeal cases calomel sublimations are often of great value, but often fail to benefit. Calomel does not disinfect the air passages, as some writers affirm.

At the Willard-Parker they prefer tracheotomy to intubation in cases where beside the laryngeal diseases there is exudation or pseudo-membrane in the pharynx as it is so difficult to keep up local treatment after intubation. Large doses of tincture chloride of iron and stimulants are routine treatment.

In all statistics of the results of treatment it must be kept in mind that when the membrane is entirely, or nearly entirely, confined to the tonsils, the cases recover under any proper treatment, it is only laryngeal cases and those where the whole naso-pharynx and pharynx are involved that are apt to do badly. This of course accounts for the small per cent. of deaths in the irrigation cases, namely six per cent.

Until the development of the antitoxine treatment there was no substance that we could put our trust in to really prevent and neutralise the products of the bacilli which were absorbed into the blood.

As this subject is one of such recent interest and as the trials now in progress at the Willard-Parker have fully substantiated the results claimed by European observers, I hope Dr. White will tell us his impression received from his use of antitoxine.

Before asking him to do this I will briefly review the results obtained in Europe.

ANTITOXINE TREATMENT.

We all know that most infectious diseases run a certain course and then if the patient survive, he is, as a rule, exempt for a time at least, from another attack. He is immune. In diphtheria many have been led to think that one attack predisposes to another, but this is not true, at least within a short period. A convalescent case is certainly not liable to another attack within a year, for in only four in six thousand cases has the department learned of a second attack in this period. It is pseudo diphtheria which recurs.

None of us would think of isolating a case just convalescent from diphtheria from another case still sick.

There is something then in the condition of the body which unfits it for the growth of the special micro-organism after it has recovered from the disease caused by that micro-organism. This substance in diphtheria is found to be especially abundant in the serum of the blood and is probably caused by the reaction of the cells of the body to the toxines of the disease. The exact relation between this acquired immunity and inherited immunity is still a matter of doubt. By certain methods it was found possible in certain diseases to so treat animals that their blood would contain a large amount of this antitoxine.

The two chief methods of doing this in diphtheria were to give a horse or goat or other large animal repeated doses of the toxines produced in old cultures of diphtheria bacilli, or less often to give injections of minute doses of virulent bacilli, the doses of toxines or bacilli to be gradually increased until large amounts were injected.

When the blood of the animal contained sufficient of this antitoxine, this substance which neutralised the poison of diphtheria, its blood was ready for use in man. The serum from this blood was then used to inject hypodermically in small doses. One half of a cubic centimetre, if of the highest strength, was sufficient to prevent diphtheria in a child, and five to sixty cubic centimetres to cure cases of diphtheria,

the larger amount being in cases which came late to treatment or showed extensive lesions.

Let us look for a moment at what we hope to counteract in diphtheria.

The danger in a pure case of diphtheria is in the effect of the absorbed poisonous materials caused by the growth of the bacilli. The bacilli are mostly in the pseudo membrane; to a less extent in the nearest glands, or even blood. In the extension of the diphtheritic membrane into the larynx, trachea, and bronchi, we have the added danger of mechanically hindering the breathing.

In cases of mixed infection, a true septicaemia, due to streptococci, may occur. Still further, other bacteria causing gangrene may add to the poisons being absorbed. If the individual has overcome all these dangers, he may still succumb to secondary lesions.

Severe parenchymatous nephritis effects on nerves and heart may appear weeks later.

However serious the lesions caused by the associated bacteria are, they do not usually occur unless the diphtheria bacilli have prepared the soil. If the diphtheria toxines have been allowed to act so long on the body that organic changes have taken place which prevent the continuance of life, no treatment can avail which only affects the circulating poison—the same is true of cases where intubation or tracheotomy does not relieve, or hepatisation of the lungs has already occurred.

These facts indicate that hospital cases are the least favourable cases for this treatment by antitoxines. Kossel has reported from Germany in all 233 cases treated by injections of antitoxine, with 77 per cent. (179) recovery.

Treatment begun on.	Per cent. recovered.	No. of cases.	Died.
First day's illness.	100	7	
Second "	97*	71—9 tracheotomised	2—2 t.
Third "	87	30—7 "	4—1 t.
Sixth "	47	17—7 "	8—5 t.

* One died from pneumonia.

For seven years in the city hospital at Friedrichshain the cases admitted in the first two days show 34.7 per cent. mortality.

From Paris we have the careful results of a long series of investigations by Roux.

He first details the results of treating experimental diphtheria in animals, showing how sufficient doses of antitoxine when used early in the disease invariably produced a cure, while the animals having diphtheria equally severe with those treated with serum always died.

The mortality in the children's hospital for the three years before the serum treatment was tried was 51.71 per cent.

In the other children's hospitals in Paris it remained as high as 60 per cent. this past winter.

During this time Roux treated 448 cases diagnosticated as diphtheria, with a mortality of only 24 per cent.

Of cases not involving larynx the mortality for three years before treatment was 33 per cent. Under serum treatment, 12 per cent.

Laryngeal cases requiring tracheotomy before serum, 73 mortality; after serum treatment, 49 mortality. During same time in other children's hospitals, 86 per cent.

It is not the actual per cent. of recoveries that is so convincing, but the marked difference in mortality between the cases treated by serum and the cases not so treated—all other conditions being the same.

All observers who have used sufficient amounts have noticed the great improvement in the general condition of the patients. They became brighter, colour and pulse improved, appetite returned, and in early cases the temperature when elevated fell.

Some have found the membranes to separate much quicker than is usually the case, while others have not been sure of this. All believe the extension of the membrane is stopped or greatly retarded.

The results of the treatment of twenty cases of severe diphtheria at the Willard-Parker hospital have been very

encouraging. The children were, with one exception, under five years. In sixteen the larynx was involved. But four of these twenty cases died, and two of these died of bronchopneumonia occurring after all signs of diphtheria had disappeared.

We have, therefore, at the present moment, every reason to believe that in this antitoxine contained in the serum of the immunised animals we have obtained a substance which has marked value in neutralising the poisons which cause the lesions of diphtheria and probably also a substance which gives an immunity from the disease of some weeks duration.

TO WHAT DEGREE IS PSEUDO-DIPHTHERIA COMMUNICABLE?

In the circular of information, issued by the New York city health department, it is announced that cases which bacteriologically proved to be false diphtheria would not be kept under the supervision of the department. Some who approve heartily of the rest of the work of the board in its dealings with diphtheria, believe in this step it has made a mistake, and that the pseudo-diphtheria cases, though less contagious than the true, are yet sufficiently so as to render isolation necessary. From the experience obtained in these experiments and in the diphtheria hospital, it was believed these cases were so little contagious, that visiting by the department inspectors was unnecessary. Nevertheless, to investigate this question thoroughly, four hundred and fifty cases of false diphtheria, as nearly consecutive as possible, were investigated, all sources of contagion sought for, and the cases followed up for two weeks after complete convalescence. In none of these was isolation or disinfection enforced by the health department.

Careful investigation failed to show that there was any more likelihood of secondary cases occurring where no isolation was enforced than where it was rigidly carried out.

About ten per cent. of the cases were found to have occurred at the same time with or shortly after some other case.

In this connection we must remember mild throat inflammations are very frequent, especially in the early spring months, and that it is quite possible, where two cases occurred in a family together, or within a short period of each other, that they may have both been due to exposure to some common condition rather than to direct transmission. The presence in nearly all healthy throats in New York city of streptococci renders this assumption almost a probability. The presence of the same germs in healthy throats as in those of patients suffering from pseudo-diphtheria prevents us from deciding the point by bacteriological examinations. A good illustration of the difficulty in determining whether these cases are communicable will be given in some examples later on.

Even if further investigation should seem to prove the cases of pseudo-diphtheria which were found to have had some connection with other mild sore throats, were due to contagion and not to the simultaneous effects of atmospheric or other deleterious conditions, there would still be an important practical objection to sanitary supervision or enforced isolation. Nearly all of the cases, except those having scarlet fever or croup, were mild; indeed, leaving out of consideration the cases which occurred as complications of scarlet fever, there was only one death in each ninety cases of pseudo-diphtheria, and in these cases there was no history of infection or contact with other cases.

THE RESULTS OF SOME COMBINED CLINICAL AND BACTERIOLOGICAL EXPERIMENTS IN CASES OF PSEUDO-MEMBRANOUS INFLAMMATION AND ACUTE TONSILITIS.

The exudate in forty cases was carefully examined bacteriologically, and the cultures from all of these contained streptococci and on most of the plates the streptococci far outnumbered all other micro-organisms.

As in normal throats so here, the streptococci taken from different cases, or even from different colonies of the same

case, differed greatly in their growth and appearance. In most of the plates the long chained streptococci resembling the streptococcus pyogenes were the most numerous, but in quite a number the short chained cocci were in the majority.

Staphylococci were often present in large numbers and other bacteria were frequently added.

Persuaded by my experience in throat clinics and by the results of examinations of normal throats, that streptococci were probably harmless, while the mucous membranes were intact, I tried the following experiment:

INOCULATION OF HUMAN THROATS WITH STREPTOCOCCI.

A very thick culture was made on agar plates from a severe follicular tonsilitis in a young child, so that there was obtained a luxuriant growth of streptococci growing both in long and short chains and also of other micrococci. A large amount of these mingled bacteria were with the permission of the patient plastered on a swab and then rubbed gently on his right tonsil and into its crypts.

He felt a peculiar sensation in the tonsil for some twelve hours; this then passed away and was probably simply the result of the mechanical irritation.

The next morning the tonsil appeared healthy except for a small patch in a crypt; from this and from the throat, cultures were made.

The plates gave very numerous colonies of streptococci, while cultures made from the same regions the day previous to the experiment gave very few streptococci.

A second trial was made in a similar way, from a culture of streptococcus pyogenes, eighteen hours old, from a case of extensive pseudo-membrane and tonsillar abscess.

The results here were also entirely negative except for the increase of streptococci in the throat for some days. With this same streptococcus the tonsils of two other adults were daubed and with similar negative results.

These trials having shown that in three throats the appli-

cation of streptococci from cultures made from virulent cases of tonsillitis produced no effect, a different experiment was tried. On two different occasions a sterile swab was rubbed on a case of severe tonsillitis and then rubbed immediately on a healthy tonsil. In neither case was there any inflammation excited. On the third day after the last experiment, a sudden fall in the temperatures occurred and after exposure a follicular tonsillitis developed, such as frequently has followed previous similar exposures.

After rubbing the bacteria on the tonsils patients were cautioned against eating or drinking for some hours and used no antiseptic gargles for several days. They also carefully guarded against taking cold.

Though these trials are only a few in number, they are enough to make it probable that the pyogenic cocci are not sufficient as a rule, to light up an inflammation in the throat.

A change seems necessary in the mucous membranes, either from the influence of some infectious disease or of some exposure before the bacteria find the throat a proper soil for rapid increase and the mucous membrane vulnerable to their action.

When we examine the cases coming before us we find that they do not conflict with these views.

Let us look at a few illustrative histories where the communication of the disease seems at first glance certain.

Case I.—A family of eight, mother aged forty-five, six children whose ages ranged from twenty-five to ten, and a grandchild, aged two, slept in two rooms of a tenement just under the roof. Two days previously a heavy snow had fallen, and the day before, the roof leaked, thus causing the room to be very damp. The next morning four of the children had more or less marked tonsillitis with follicular deposits or croupous patches, and on the following day the baby had an attack of croup.

Case II.—In a school for young girls, on a day early in the winter, five were taken with follicular tonsillitis, and on the next day three more were attacked.

Case III.—A woman was caught in a cold rain storm, she was drenched and chilled; four hours later the tonsils became painful and she felt ill. The local and constitutional symptoms increased, and she passed through an attack of suppurative tonsillitis.

Case IV.—A man, aged twenty-six, comes to the dispensary with croupous tonsillitis which he ascribes to an exposure four days before. He asserts that every winter he has one or more attacks after taking cold.

Case V.—A nurse attends a patient with croupous tonsillitis, and has to pass frequently from the warm room to a much cooler hallway. On the third day the nurse is attacked with an inflammation much like that of his patient. The physician in charge ascribes it to a direct infection from the patient to the nurse.

Of very many cases examined, only a minority have been in known contact with others having similar inflammations.

Another important consideration tending to show that exposure rather than direct infection is usually the direct exciting cause, is the fact that these inflammations are very prevalent in the cold and wet months. About the first of December they begin to multiply in dispensary and private practice and increase till April, then slowly diminish till June, to remain very infrequent till winter approaches. This rapid increase in the late winter and early spring is not found to be true to the same degree in diphtheria.

The histories of many of these cases would indicate that the bacteria already present in the throat had been excited to a new growth by some exposure, rather than that a new infection had been received.

Some of these croupous inflammations may indeed be due to a recent direct infection for we would expect that the bacteria from a fresh inflammation would be somewhat more virulent than those which had long laid dormant in the throat. The proof of this is, however, difficult; for it is impossible to tell from cultures, and the histories often give no assistance. Where attendants on the sick or persons in schools and hotels are attacked, after other cases have developed, it is difficult to determine whether they have derived the disease directly from the previous patients, or have developed it simply because they were subjected to the same sanitary influences as the first. The important fact is that if we keep ourselves from exposure to cold and other deleterious influences we are in little danger of contracting this variety of acute throat inflammations.

DIPHTHERIA.

By John Cronyn, M. D., of Erie County.

October 9, 1894.

To our knowledge of the etiology, pathology, or treatment of diphtheria it would seem as if there were nothing to add, from the fact that the disease since its earliest recognition has been almost continually written about. And this, of course, is not to be wondered at when we consider its virulence and fatality all over the world. The title, "Angina Maligna," given to the laryngeal form of the disease before the days of Bretonneau, who elaborated very fully the nature of the affection, has its full significance from the too common manner in which it destroys life. But more to the purpose was the demonstration that this degenerative disease of the mucous membrane did not confine itself to the throat, but would be found upon any part of the organism lined by mucous membrane. It was not shown by writers of that day, however, nor by many of the present, that in the production of the membrane the specific poison's first effect was to destroy the vitality of the mucous surface—to produce necrosis in fact, and so permit the peculiar exudate to form upon the submucous and connective tissues. No one will dispute the necessity for such a pathological change who will consider the anatomical and physiological characteristics of mucous membrane; for in the many examples presented of inflammation of mucous membrane ulcerative action will be found without exudates of that fibrino-plastic material called *diphtheria*. Why is this? Because the poison, whether taken through food or air, or generated in the economy itself, or by inoculation, produces so great a perversion of the healthy, nutritive properties of the blood that advantage is taken of the weakest tissue to make itself manifest in the destruction of one membrane and in the formation of another.

I make these few observations to indicate the line of argument upon which I would base what I have to say upon this subject.

All are agreed that the disease is acute, is specific, is infectious, but are not agreed as to its mode of invasion. A few hold that it is constitutional *ab initio*, manifesting certain local features peculiarly its own. The great majority believe the primary state to be local, producing constitutional evidences afterward if the disease be severe in form. Now, in my judgment, nothing can be more injurious to the successful treatment of the malady than this wide difference of opinion among authorities—and such is found to be the case in the varied methods daily recommended and pursued. It is scarcely necessary to mention that he who looks upon the affection as entirely local will direct all his efforts to the removal of the local manifestation, to the neglect of constitutional means. It is true that while he makes repeated applications of the bichloride of mercury he also recommends tincture of the chloride of iron and stimulants; but if you compare his anxiety as to constitutional and local results you find the preponderance to be with his local means. Do you doubt? Look at the "*Armamentarium Medicinae*" for local use, and the few medicines he thinks it worth while to administer internally. This is the natural outcome of the theory that the Klebs-Loeffler bacillus applies itself to the surface of the fauces or tonsils and produces a specific form of irritation made evident by the exudation on the surface of the mucous membrane—which if only rapidly removed ends all further danger or anxiety.

How true this description is, is proved by the vaunted success of almost every new remedy for application, from caustic potash to gabloids of sulphite of magnesium—yet the mortality is fearful and investigators are labouring diligently to lessen it. Will the recently discovered antitoxine of Koch, so favourably reported of by one of our best bacteriologists, accomplish it? It proposes to prevent as well as cure, and is expected to act much as vaccination for cow-pox does.

This being proven, where will the theory of local origin stand?

Delaying the answer to this, let me call attention to the mode of development of all the exanthemata. Do they not, after the exposure to infection, require a period of incubation before their characteristic features exhibit themselves? And is this not due to the reception of the poison into the general circulation, thereby producing those pathological evidences common to whichever of the affections it may be? The incubative analogy holds in diphtheria, and therefore the constitutional infection. But are there not cases in which there seems ample proof of only local origin?

To my mind, this is but apparent; for, recollecting that the intensity of any poison producing disease is evident only in proportion to the susceptive or resisting power of the individual attacked, milder, or severer, or a pseudo, or true form of the affection presents itself, not the less systemic, however, in either case — all of which is proven by the sequelae that so commonly occur. It has happened on more than one occasion that the membrane under local applications has disappeared entirely and the patient been considered out of all danger, when suddenly difficult breathing sets in. Its cause thought to be confined to the larynx, trachaeotomy is performed, but the patient dies in a few hours, and the post mortem examination reveals the bronchial tubes filled with the diphtheric exudate. Is it to be supposed that this state of the lungs follows the disappearance of membrane from the fauces? Not at all. The condition of the blood remains diseased, and the improved state of the patient inclines to the discontinuance of the general treatment — which has played a more important part in the removal of the faucial membrane than it gets credit for—and to a rapid development of the latent membrane in the lungs, where neither tracheotomy nor intubation can be of the slightest service— and death ensues.

It has occurred often enough to be kept in mind that there are no throat manifestations of the disease save a little swell-

ing and engorgement; yet the patient very soon presents all the accompanying features of the affection in albuminuria, threatened lesion of heart's structure (so-called heart failure), paralysis, etc., all of which, and much more, convince me that diphtheria is the result of a poison received into the economy through those channels indicated at the outset of these remarks. Protean indeed are the many phases of the diphtheritic poison, which, to successfully meet and combat, will need the constant vigilance of the medical attendant and the ever-present consciousness that it may be local, it is always constitutional.

To prove, to some extent, this contention of mine, let me give a few examples:

Dr. C. is bitten by accident while using his finger as a tongue depresser. He pays no attention to it nor does he suppose himself in any danger, although he very soon begins to feel that there is something the matter. Still he does not dream of his fate until somewhere between the fifth and tenth day, when a white pellicle appears upon the abrasion on the bitten finger. Caustic potash is applied, with complete destruction of the exudate, and adhesive plaster put on the sore. The general feeling of malaise continues to increase. In two days the plaster is removed and the pellicle found as at first, save that it is yellow and thicker. Caustic is again used, with the destruction of the foreign tissue, and plaster applied. By this time Dr. C. is quite sick. His throat is sore and two kind friends declare he has diphtheria very badly. A long illness and narrow escape with his life prove but too conclusively the accuracy of their diagnosis.

This case is cited to show that a stage of incubation, after inoculation, is like unto the course pursued by vaccination for cow-pox, the constitutional symptoms preceding the local manifestation.

Mrs. —— took care of her children ill of diphtheria. Some time after their recovery the mother, tired and worn out, fearing she was about to have an attack of pleurisy or pneumonia, placed a blistering plaster between her shoulders, hoping to rid herself of pain. On the abraded surface, on the second or third day, was found the typical exudate. Evidently the poison of the disease must have been roaming about in the circulation seeking a fitting spot upon which to present itself; and the blistered surface afforded the most favourable locality. Although here

was the best possible opportunity for any or all kinds of local medication the patient died.

One of the most interesting cases, probably, on record, as described by the patient himself, is the following:

Sidney A. D.—"About the first of January, 1888, during my last college year and while spending much time in the dispensary service, I was taken sick with what was at first thought to be an adynamic type of pneumonia. After about a week's suffering with languor, weakness, loss of appetite, etc., I was surprised one day at the dispensary to find my temperature at 103°. The same afternoon there was nausea, vomiting, and great debility generally. I went to bed and my temperature fell to 100.5°, where it remained for the next week. My throat now became sore and deglutition was painful. On the third day the attending physician discovered a few subcrepitant râles in the anterior portion of right lung, which after a few days seemed more generally to involve the other bronchi. The real condition was not fully realised until a croupous or ulcerative stomatitis showed itself which extended to the nose and eyes. Before this, however, I was unable to urinate, and an attempt to pass a catheter was too painful to be borne. An injection of cocaine made it possible to pass the instrument. Now all the mucous surfaces were covered with an exudate; mouth, fauces, eyes, nose, urethra, rectum."

I saw the patient at this time in consultation with his attendant, and had no hesitation in pronouncing it a formidable case of diphtheria. The local treatment, which, up to this, with very little medicine, had been considered sufficient, was at my suggestion changed to active and potent medication every two hours—with, in a few days, the best results.

Upon this case, from the beginning so manifestly constitutional, with local evidences in the places most susceptible—comment is not needed.

To multiply instances illustrating the undoubted constitutional nature of the poison of true diphtheria would be a waste of time, but errors in diagnosis are sufficiently frequent to give colour to the reports of remarkable success in recent methods of treatment. A patient has a severe rigour, followed by fever and complaint of sore throat. A gargle or spray of carbolic acid of considerable strength is at once applied before the physician is sent for. When he arrives, in looking into the throat both tonsils and pharynx are found covered with a whitish membrane. He does not stop to consider that it is

due to the acid, but at once puts whatever means he has most confidence in, whether new or old, into practice, and with time and care in a few days the patient is well.

Follicular tonsillitis, herpetic tonsillitis, and pharyngeal erysipelas have been mistaken many times for diphtheria through the indiscreet application of some of the various local remedies so commonly recommended. It is overlooked every day that many cases of death due to the diphtheric poison occur without any external evidence whatever of its existence in the economy. Professor Roux says that the false membrane always presents itself in the fauces and larynx before the system feels the effect of the poison, and bases the success of the antitoxine treatment upon the timely warning given by the presence of the membrane. It is plain then that the trend of all investigation and experiment as presented to us in Dr. Welch's elaborate report recently published, is to prove that the presence of a certain bacillus is the *Fons et Origo Mali* in diphtheria. But the mortality goes on—and the percentage of deaths greater than a pathology so well demonstrated should allow; nor will it change until a more general certainty of the constitutional nature of *true* diphtheria is arrived at and acted upon; and a rational and more effective therapeusis applied.

DISCUSSION.

Dr. Hermann M. Biggs, of New York county, said it had seemed to him that the work of the New York health department had shown beyond question that the bacteriological examination of diphtheria was an absolute essential for its intelligent sanitary surveillance, and that fact was now being generally recognised by sanitary authorities not only in this country but in Europe. If the observations which had been made were correct, and if it were true that there might be purulent microorganisms in the throat for long periods after the disappearance of the membrane, and after complete convalescence, and that these organisms were capable of producing the disease in others, it was perfectly evident that no other means than bacteriological examination could determine the time for the discharge of such patients from surveillance. The experiences of the department had been so numerous that there could be no doubt now of the correctness of their observations. Further than

this it had been, and was now, the feeling of many in the profession, that in diphtheria we had to deal always with a disease in which there was an abundant exudation of false membrane in the throat, nares, and larynx. That certainly was not true. In such cases there was no difficulty in making the diagnosis, but in a considerable proportion of cases of diphtheria such exudation did not exist. There might be virulent diphtheritic bacilli without exudation, and with only an acute hyperaemia of the throat; and between this and the typical appearance found in diphtheria there might be found every stage of variation. Where there was no membrane it was utterly impossible to make the diagnosis with certainty without a bacteriological examination; in fact the diagnosis of diphtheria was frequently not made. On the other hand, there were many cases in which there was an abundant deposit of pseudo-membrane which the bacteriological examination showed not to be true diphtheria. The plan mapped out by the New York city board of health had been adopted by many large cities in this country, and was now being adopted by a number of state boards of health, and was under consideration by the health board in Great Britain.

Regarding the value of the anti-toxine treatment, the speaker said that he had had unusual opportunities in Berlin to follow the work then going on in the Institute for Infectious Diseases. This institute had been founded by the German government for original research alone, and it had a hospital connected with it for observation of all types of contagious diseases. Connected with it was a staff of men of international reputation for work in special lines—men noted for their work in bacteriology, and in bacteriological ptomaines and toxines. Among these gentlemen there was absolutely no question as to the value of the anti-toxines in the treatment of diphtheria. It had been used in several hundred cases there, and they felt without exception that the treatment had passed beyond the experimental stage. He did not believe such a group of men was to be found anywhere else in the world, and it did not seem possible that these men had been led into error on this point. In their last series of tracheotomy cases they had had over seventy-five per cent. of recoveries.

As to Dr. Cronyn's contention that diphtheria was always a constitutional disease with local symptoms, he would rather say that it was always a local disease first. He did not mean to say that it was always locally developed first,—*e. g.*, in the throat—but that there was always a local development of microörganisms, and that these organisms produced the toxine, which, when absorbed into the circulation, gave rise to the constitutional phenomena. The anti-toxine of diphtheria was of value in the treatment of diphtheria because it neutralised in some way the toxine absorbed into the circulation from the exudation. This was true of observations both inside and outside of the body. The anti-

toxine neutralised enormous quantities of diphtheria toxine. In some of the larger animals—*e. g.*, the sheep and goat—there was a very great susceptibility to the toxine of diphtheria, as derived from sterilised bouillon cultures. The blood serum of goats or other animals, which had been immunised, would neutralise enormous quantities of this toxine. For estimating the dosage of toxine there was a toxine unit established—that is, that quantity (1 cc.) of toxine solution necessary to kill in forty-eight hours a guinea pig weighing two hundred and fifty grammes. One cubic centimetre of blood serum of an animal which had been highly immunised has been found in some instances capable of neutralising fourteen hundred cubic centimetres of such a toxine solution, notwithstanding the fact that the mixture of ordinary blood serum from animals not immunised, was absolutely without influence upon the toxine. This treatment was not, like many others which had preceded it in the treatment of infectious diseases, based upon a single empirical fact, but it was a perfectly logical and well worked out scheme which had necessarily resulted from a series of careful observation extending over a number of years. If this blood serum had such a power outside of the body, there was no reason why it should not have such a power within the body. The facts so far obtained seem to show that this was the case. It had been found that the dose must be graduated according to the weight, age, and size of the patient. It must bear a definite ratio not only to the virulence and duration of the disease, but also to the body-weight of the patient.

Dr. H. O. Marcy of Boston said he wished to express his appreciation of the great value of the subject as presented this afternoon. He had been reminded that when in the midst of his early investigation on the culture of surgical bacteria, he had chanced about fifteen years ago to be in the midst of an epidemic of diphtheria. Some of the wounds had become covered with membrane. This had led him to feel that there was a chance for investigation in this direction. In one of the tracheotomy cases during this epidemic, (in which he had had sixty tracheotomies within a short time,) some of the membrane had been used for cultures. With a solution he had made inoculations into the eyes of eight rabbits and guinea pigs. It had spread true, and had carried diphtheria through the animal—in fact it had gone further than had been intended, for the assistant, Dr. Nelson, had taken the diphtheria from the animals which he had been observing. The demonstration was thus certainly clear. There could be no question that there was a localised infection in diphtheria, and that the infectious material was a vitalised thing, developing and growing in a certain way. We all knew that all these infectious diseases had necessarily their constitutional symptoms, and that this was the reason why local treatment of the diphtheritic wound failed to destroy the infection very soon. Localised applica-

tions were of comparatively little value after the disease had once been established. When a building was on fire we had to direct our attention to all parts of the edifice which were on fire, and not simply to the place where the fire originated. It seemed to him that the experiments so far reported were very suggestive of a large series of possibilities that might arise in connection with other diseases than diphtheria.

Dr. MINARD asked Dr. Parks if pseudo-diphtheria ever produced death *per se.*

Dr. PARKS replied that it had produced death when accompanied by pneumonia, and that in these instances both diseases were probably due to the same pathogenic micro-organism. So far as he knew pseudo-diphtheria, limited to the throat, had not caused death, although of course it had produced death by acting as a mechanical obstruction in the larynx or bronchi. The death-rate in New York city was about one and a half when uncomplicated with scarlatina, and about two and a half when so complicated.

Dr. CRONYN said that the incubative period of diphtheria was proof of its presence in the circulation. He also emphasised the fact that necrosis of the mucous membrane of the fauces or wherever else it might happen upon a mucous membrane, must take place before the diphtheritic exudate made itself manifest. The first case he had seen had been exceedingly interesting. It had occurred in 1852. He pulled off the membrane, and in a few moments thereafter he found the surface covered with a thousand little spots of serum. The membrane was almost immediately reformed. This he repeated several times. He felt therefore that the disease was primarily constitutional, making itself evident in the most susceptible place—the throat, mouth, or elsewhere. The anti-toxine treatment was proof of what he had said. Some years ago a large number of cases of tracheotomy were lost in France. Then it was decided to perform tracheotomy as soon as the first symptoms of croup appeared. Of course the result was a great many more recoveries, but it was equally evident that a great many of these tracheotomies were entirely unnecessary.

THE DIAGNOSIS AND TREATMENT OF PLEURISY.

By J. Blake White, M. D., of New York County.

October 10, 1894.

If it were true that the symptoms of pleurisy were identical in all cases, it would be only necessary to memorise the summary contained in systematic treatises on the subject; but as we know this is far from being the case, since the several circumstances contained in idiosyncrasy and the varying power of the causes of this affection, exert such a potent influence in regulating their manifestations in the human frame.

Not a few have been induced by this perplexity to look for some symptom which of itself may determine the nature of the malady and called "pathognomonic." Some of the most skilled have fallen into error in the vain effort to attain such simple indications.

By auscultation and percussion we are enabled to reach evidences that appertain to diseased action in a more direct way than by observing evidences which are occasioned indirectly through disturbed function. From acoustic signs the nature of pathological changes is most largely deduced. In the case of a thickened pleura the relative density of the parts is discerned by percussion; by auscultation we learn that the acoustic properties of the cavity of the pleura are changed by disease, but the causes of these phenomena we must look for elsewhere than in the phenomena themselves.

Crepitation has been spoken of as pathognomonic of pneumonia, but when we consider how often it is that other causes produce the same effect, or so nearly like it as to be almost impossible of being distinguished from it, we cannot

fail to see how easy it is to mistake sounds caused by varied conditions affecting structures outside of the lung itself.

With the remarkable similarity of sound between the crepitation of pneumonia and that superinduced by the fine friction of pleuritis we are all familiar, yet after careful auscultation the practised ear will readily discern the relative distance of the sound from the surface, which will so greatly help to clear up the diagnosis. There is a sharpness and clearness, as well as nearness, imparted to the ear by the pleuritic friction sound, as contrasted with the more distant crepitation of pneumonia, that renders differentiation ordinarily not a very difficult undertaking.

Usually pleurisy sets in with a pretty smart chill, followed by fever and pain in the side—the "stitch" of the old authors. These symptoms apply more particularly to acute pleurisy; in the sub-acute types the attack comes on more insidiously, and is the form of pleurisy which we more frequently encounter at the present day. The sharp pain is not then so characteristic, neither is the chill nor the fever. There is, however, more constantly observed a sense of general languor and debility, also a sense of heaviness about the chest, which restricts respiratory effort, and associated with a dread on the part of the patient to take a deep breath or to attempt to cough—all of which constitute symptoms so commonly characteristic as to be regarded almost pathognomonic. In addition there is the peculiar movement of the *alae nasi*, with hurried, shallow breathing, which are also present in peritonitis, though manifesting shades of difference easily discernible.

Auscultation reveals in pleurisy a breath sound more or less suppressed or jerky, occasioned by inability to take a full and steady inspiration through fear of pain; while the expiration is harsh and prolonged. Over the actual seat of inflammation the vocal fremitus is exaggerated at an early period, and friction may also be detected at an early stage.

I am in the habit of relying upon forced expiration quickly performed, as in the act of extinguishing the flame of a can-

dle, for the purpose of intensifying impaired tone of respiration, which would otherwise escape notice in an ordinary examination. I have thought that by a quick, forced expiratory effort any defect of respiratory function, however slight, could thus be brought into notice, and at the same time an estimate of the degree of pulmonary action would be facilitated.

When the diaphragmatic portion of the pleura is attacked, symptoms referable to the digestive organs become prominent, and likewise when the lesion is circumjacent to the pericardium, disturbance of function relating to the heart will arrest attention.[1]

It is certain that if the knowledge of the relation which disturbed function of these remote organs bears to symptoms of pleurisy could be sufficiently appreciated, error in diagnosis would less frequently occur.

The face in pleurisy manifests a peculiar apprehensive expression, which, though difficult to define, is nevertheless full of clinical significance.

Palpation, percussion, and auscultation are properly regarded as the three great factors in diagnosis, though I have not placed them in the order of their relative importance. By the first it is possible to detect friction, expansion of the chest, and, when extensive effusion has occurred, to appreciate absence of vocal thrill, obtain fluctuation as well as information of levelling of the intercostal spaces. It is well to bear in mind that ronchal thrill may simulate pleural friction, which can only be discriminated by auscultation; then additionally, that loss of vocal thrill, as pointed out by Reynaud, may result equally from gaseous as well as fluid effusion. Relative modification of sound is ascertained by percussion, as slight or extensive effusion exists or the pleural membrane is thickened, but the same result is noted sometimes in either of the latter two conditions.

While extensive consolidation of the lung may rival effusion, I do not think that its degree of density would be as likely, as in the latter case, to obscure respiration so com-

[1] Trans. of N. Y. State Association, 1893, p. 103.

pletely that the ear of an expert examiner would fail to discover at least some faint respiratory sound over a very limited area, especially if the patient is directed to execute the quick expiratory efforts to which I have already referred.

Piorry has likened a peculiar quivering sensation produced by percussion when the chest is distended with serous effusion, to a condition fulfilled by most hydated cysts, and has given to it the name of "hydated thrill," a term which is very expressive of the state described.

By far the most reliable evidence, however, in all cases, is to be found in clean and neat auscultation, which is possible to be cultivated to the highest degree of perfection.

Soon after pleuritic invasion, friction may be heard and percussion resonance is either modified or dullness may be revealed.

The disease may not progress to the point of effusion, but in some cases, associated with cachexia, a copious effusion of lymph takes place without serum, followed by a dusky red countenance, enforced brilliancy of the eye, shock to the vasomotor system, resulting in hyperidrosis with diminution of urine, evidencing marked deficiency of chlorides; all of which served to denote that the inflammatory fever tends to a fatal issue. In these cases, friction sound diffused over a large area, is both pronounced and persistent; resembling very closely the crepitation of extensive pneumonia of low grade. Nevertheless, some cases in the early stage are marked with such obscure evidences of invasion, and so little disturbance of either the general health or the function of respiration, that no indications whatever appear to point to the mischief that is going on in the pleura, until large serous effusion creates a sudden embarrassment of the breathing. At this stage the diagnosis is facilitated by progressive dyspnoea, a sense of painful heaviness of the chest; an erect posture with an inclination to the affected side, attended with a more or less anxious and suffused facial expression.

I have observed that some patients will manifest more sensitiveness to manipulation of the affected side, which is

more marked, however, when the effusion is purulent. Percussion is naturally dull, its nature being very characteristic and best described as dead, inelastic, and resistant. The respiration, at the base, is absent, while higher up it is bronchial, with expiration prolonged. In children, however, tubular breathing is sometimes heard through fluid at the base, and when this is noted, it renders a diagnosis of effusion without the aid afforded by the exploring needle, not an easy undertaking.

Aegophony may be heard about the lower angle of the scapula where also metallic tinkling is discerned, but these sounds are less apt to be produced when the effusion is so copious as to occupy the full capacity of the pleural cavity.

I do not attribute much importance to cardiac displacement as an aid to diagnosis except when the effusion is abundant and occupies the left side, as the same condition may be occasioned by mere plastic adhesion, therefore it does not constitute a particular feature of serous or purulent effusion.

The differentiation between pericardial friction and plueral friction, referred to in a previous paper[1], depends mainly on its difference of rhythm; and, as so graphically explained by Walshe, upon "the limitation of the sound to either edge, generally the left of the cardiac region; fixity in one or more particular spots; cessation complete, or, what is more common, occasional, with certain beats of the heart, when the breath is held after expiration; and marked unsteadiness in the intensity and quality of the friction, which is heard to one side and not in front of the heart." All these circumstances argue in favour of friction of cardiac rhythm being of pleural rather than pericardial origin. Furthermore, change of friction into creaking is more common in the pleural, than in the pericardium, a circumstance which affords, sometimes, a good point of diagnosis.

Cough, when present, is ordinarily dry, harsh, and ineffective, though occasionally some mucoid expectoration, which is brought up with difficulty, may be observed.

[1] Trans. N. Y. State Association, 1893, p. 104.

An interesting, as well as important occurrence in pleurisy with adhesion, is a constant desire to clear the throat. Without throat lesion, this is a peculiar symptom, and I believe I was the first who ever called attention to it, in a paper read before this association[1] a year ago.

I have noted that the character of the effort to clear the throat, affords a very good indication of the locality of the adhesion.

A peculiar "cracked pot" sound is sometimes heard at the apex when the lung is pushed up by an effusion of serum occupying the entire side of the chest, which, being due solely to the condensation produced by the pressure of the fluid below, must not be confounded with the similar sound due to a cavity at the same site in the lung. Some authors refer to the presence of this tympanitic resonance as a condition very likely to mislead in diagnosis; but I think the knowledge of this circumstance will make an examiner look for further corroboration in either instance before a final conclusion is reached.

The relation of dullness and absence of breathing about the chest to change of posture, affords strong confirmatory evidence of effusion. Again, it is safe to conclude that fluid is in the chest, if a high pitched resonance is detected below the clavicle; though in rare instances this symptom is not present.

When adhesions bind down the lung, and prevent observation of the alteration of breathing by change of posture, the exploring needle may properly be used to clear up any possible doubt. The fear of evil consequences from exploratory puncture, expressed by some, is not well founded, provided due care is exercised in the selection of the site for puncture, with dexterity in its performance, and every antiseptic precaution is assiduously followed. It is my habit to push the integument up slightly, before making the puncture, so that after withdrawing the needle, the layers of tissue readjust themselves in valvular form, thus effectually preventing

[1] Trans. of N. Y. State Association, 1893, p. 104.

entrance of air or infiltration from the oozing out of fluid. A thin wad of absorbent cotton moistened with a weak carbolic acid or bichloride solution, covered with oil silk, is then applied over the punctured spot, and held in place by two or more narrow strips of adhesive plaster.

Exploration is often performed with an ordinary hypodermic needle, which is unfit for the purpose, in my opinion, and accounts in many instances for failure to verify the presence of fluid. In the first place, it is not sufficiently long to enter the pleural cavity in muscular subjects, or to penetrate the pleura, when much lymphy exudation coats the pleural membrane; secondly, the calibre is too fine, except in simple serous effusion, to permit of the withdrawal of any fluid through it. A needle especially designed for the purpose should be selected, having a calibre of at least one quarter to one half millimeter in diameter, and two or more inches in length.

Pleurodynia is an affection which may be confounded with acute and subacute pleurisy in the "dry period," but the pain of the former condition is rather of the nature of a catch to the inspiration, than the sharp, darting, and more durable pain of pleurisy. An hypodermic of morphia, with atropia, when there is any doubt, will promptly relieve painful respiration, so that freedom of this function being permitted, the characteristic friction of pleurisy can be readily ascertained.

The early invasion of phthisis, perhaps, most frequently tests the physician's diagnostic acumen, since it is not only often associated with, but in some cases most readily follows, pleurisy.

Cachexia and progressive emaciation are not so indicative of phthisis alone as generally supposed, for they are equally symptomatic of some types of pleurisy, and therefore require corroborative proof of the condition of ill health with which they are associated.

Bacteriologists will tell us that the only sure means of diagnosis is to be realised in the absence or presence of the bacilli of tuberculosis, but we all know how unreliable is this

evidence in the earliest stage of phthisis, even when there are other clear indications of tubercular invasion to be observed. Many of us will call to mind cases in which a pleurisy was apparently wholly recovered from, yet, before many months passed by, subsequent definite signs of phthisis appeared, though there were no evidences, bacilli or otherwise, that such pleurisies were tubercular in their nature. We know, also, how often, when bacilli are not present, cases manifestly tubercular progress to a fatal issue. When detected in the sputum, the bacilli undoubtedly afford us valuable confirmatory evidence in diagnosis, but their absence cannot, under the circumstances, necessarily preclude a diagnosis of tuberculosis, and it is not safe to defer a diagnosis until their presence is verified in all cases.

Treatment.—Upon the question of treatment I advance with becoming hesitation, because I address a body of practitioners each of whom is, no doubt, inclined to his own peculiar mode of practice. There is no such thing as a stereotyped plan of treatment for pleurisy, as I have under different forms of treatment experienced excellent results.

There are, however, few maladies in which, at the outset, active and skilful attention are better rewarded than in the management of acute pleurisy. The chief aims are to relieve pain, subdue fever, lessen inflammation, and control, as far as may be possible, the tendency to exudation. The first can best and most promptly be accomplished, by an appropriate dose of morphia and atropia hypodermatically administered; and by encasing the chest in one layer of lamb's wool wadding after applying to the surface a terebinthinate liniment. By the wool dressing a uniform temperature of the surface is maintained, and peripheral sensitiveness to chill prevented. Usually one hypodermic effectually and permanently quiets pain, but there is no objection to its repetition if necessary; however, the embrocation should be applied once or twice daily, until recovery occurs. If the fever is high, a powder containing some one of the antipyretics, combined with calomel and Dover's powder; or the antipyretic

with Dover's and James's powders, in appropriate doses every six or eight hours, may be given. Of course, omit the Dover's powder in the first dose, if the hypodermic has been previously administered. In addition to the above treatment I find the spiritus mindererus a very serviceable adjuvant to the therapeutics of pleurisy. By these remedies pain is relieved, the functions of the skin, kidneys, and bowels are favoured, and vascular tension materially diminished.

As the digestive functions are always more or less impaired while the fever lasts, some little attention should be paid to the dietary. Nourishment ought to be introduced principally in fluid form. Milk alone, or combined with the powdered beef peptonoids, constitutes a most acceptable form of alimentation. The liquid peptonoids or soups with some form of pepsin may also be advised.

Stimulants are contra indicated except in some rare instances when suppuration threatens, or when in the late stages the vital powers manifest depression from prolonged illness.

Strapping of the chest, after the method of Dr. Roberts of University College hospital, to give rest to the respiration, has received the warm support of many physicians; but I cannot give this my approval except it be continued a very limited time. There is no doubt that by modifying chest movement, as well as restricting pulmonary action, pleural pain is materially lessened; but if this dressing is maintained for any length of time, I apprehend serious consequences, affecting both the pleura and the lung, may follow, and structural changes of a more or less permanent character about these parts will take place. If any appliance of this sort is deemed necessary, I have decided preference for an elastic gauze bandage which would answer every purpose designed by the plaster strips, and could be more promptly and easily removed when desired.

Strips of adhesive plaster applied as advised by Dr. Roberts, would admit of so little rib motion, and would lessen to such a degree pulmonary function, that not only would

the air vesicles be liable to become clogged with mucus and occasional congestion, but plastic adhesions also of a permanent character would be very apt to take place about the pleura.

In all cases, at the outset, I would favour the general principle of treatment first referred to, with such modifications thereof, as each individual case seemed to require.

Usually, no restrictive appliances to the chest are required, and I believe if such measures can be dispensed with, the passive respiratory action being uninterrupted, the pleura and lung will escape changes in their structure, such as I have already indicated.

After the acute stage is passed, friction of the chest may be continued with a liniment composed of turpentine, laudanum, camphor, and oil of sassafras; or a solution of iodine may be applied, one drachm to one ounce of sulphuric ether, as recommended by Dr. Bowditch. If adhesions form, and there remains a sense of soreness over any part of the chest, small blisters in several spots, will prove of great value; and iodide of potassium or strontium internally, will facilitate recovery.

When frequent vesication is desired, I have for some years used pure carbolic acid, and endorse Ollivier's commendation of it, in the case of children, where, especially, it is preferable to cantharides.

In subjects manifestly cachectic, the iodide of manganese or iron, together with cod liver oil, or malt in some form, might very properly be prescribed; and I might here add, that the manganese preparations agree better with those pleurisy cases complicated by the tubercular diathesis.

The chloride of iron in some form, constitutes one of the best diuretics in some cases with small amount of serous effusion, and also serves as an admirable tonic after aspiration. Anstie recommended its administration throughout the conduct of all cases.

Salicylic acid, and salicylate of sodium, have not shown in my experience any special value in ameliorating or shortening the course of the disease, and I have not considered their

use as diuretics, superior to chloride of iron, the liquor ammoniae acetatis, or the acetate and nitrate of potash alone or in suitable combination. I am disposed to believe with Dr. Parsons[1] of Northampton, Mass., that the salicylates may be useful only when pleurisy is secondary to rheumatism, but are not to be depended on, in the primary form of pleurisy.

The so called "thirst cure" and a course of Jaborandi have their advocates, but such cases as would be likely to resist the other remedies I have mentioned, would not, in all probability, be benefited in the least by the two alternatives named.

It would be really diverting if not so serious a subject, to contemplate the views and opinions of prominent men respecting the value of the various remedies and modes of treatment advocated for pleurisy. What one lauds highly for apparently valid reasons, another condemns in unmeasured terms, and that which he in turn declares of superior advantage, another equally learned brother as surely adjudges useless. The fact is, that no fixed rules of treatment will apply in all cases, individual temperaments are always to be considered, and a study of the character of the invading malady must not be neglected.

If the case resists all measures of treatment, and effusion both persists and increases, operative interference becomes necessary. Therefore when sufficient effusion has occurred, the sooner aspiration is undertaken, the better it will be for the patient. No danger need be apprehended through the procedure. To wait until effusion has occurred to the extent of compression of the lung, so that breathing becomes embarrassed, is not, in my judgment, either prudent or enlightened practice. With Drs. Didama, John Shrady, Cronyn, Truax, and others, I believe that early aspiration not only prevents chronic pleurisy, but also wards off other complications.

From remarks made in a discussion which took place on this subject, at the last session of this association, by Drs. T. H. Manley, John Cronyn, C. A. Leale, and E. D. Ferguson,

[1]Trans. of N. Y. State Association, 1892, p. 265.

of New York, McLean of Detroit, and Dandridge of Cincinnati, it would be very natural for anyone to infer that aspiration is not so simple an operation as it appears to be; and I am inclined to take the same view of it as they do. I was, however, much gratified to hear the able defense advanced for the practice of aspiration by Dr. Cronyn of Erie county, whose experience as to its value, fully fortifies the opinion in this regard entertained by myself.

When we have to deal with simple, serous effusions, one aspiration will often suffice, though instances do occur when two or more are required to complete recovery. Success in achieving permanent benefit is attributable to both skill in its performance and judgment shown in the extent to which the cavity is emptied. All authorities caution against the too complete withdrawal of the fluid, believing that by removal of the entire amount at once the absorptive power of the pleura may be destroyed and reaccumulation rendered more probable; while there is some danger through such an injudicious proceeding of sudden death from congestion of the lung, occasioned by its too rapid return to its normal condition. There is no doubt that absorption is often so remarkably facilitated and increased by partial aspiration that the case will readily yield to subsequent medicinal treatment without further surgical measures.

In empyema this resource should not find favour, unless undertaken as a measure of temporary relief when pus so completely fills the pleura and the condition of the patient is so threatening as to render an operation for external drainage too hazardous to attempt. In such an emergency it would be manifestly a better plan to aspirate first, thereby placing the patient in a more favourable condition to withstand the greater shock of subsequent incision.

As to the relative value of the two methods, I am convinced that in empyema the open drainage expedient supersedes aspiration, for through its more thorough means of evacuating the pus there is less danger of exhaustion from chronic septicaemia or secondary abscesses.

Much has been written in relation to resection of the ribs when operating for empyema, and I am gratified to note that surgeons, at the present time, are taking a far more conservative view of this subject. The majority of authors, I think, are adversely disposed to the operation, except in those rare instances where the lung is confined by strong adhesions, leaving a large suppurating cavity not likely to contract and close, without excision of a portion of one or two ribs.

In my own experience, resection of a rib has not been practised in children where empyemas were simple and uncomplicated, for I have found that perfect drainage could be maintained, when a suitable drainage tube is selected. The ordinary soft rubber tubes used for this purpose, are not sufficiently firm to overcome compression by the intervention of granulation tissue, and consequently soon become inadequate for drainage; but the corrugated white rubber tubing, which I exhibited in 1892[1], has never failed to give me entire satisfaction in these cases, and appears to meet every requirement for the purpose of effecting long continued drainage.

The indiscriminate use of antiseptic injections cannot be too strongly condemned, since many fatal results have immediately followed its practice. Immediate washing out of the pleural cavity, after operation for ordinary empyema, is always an inadvisable and hazardous procedure, only permissible at later periods, when performed with greatest caution.

In the case of gangrenous cavities, however, while I believe antiseptic injections are generally indicated, and are always better tolerated, the douching should always be performed with particular care. The plan by syphonage is much preferable to syringing, for reasons which will readily appear to you all. I have known metastatic abscesses, involving important large joints, follow too diligent irrigation of the pleural cavity after operation for simple empyema, seriously complicating and prolonging convalescence.

Prompt recovery after operation can alone be fulfilled by

[1] Trans. of N. Y. State Association, 1892.

the most assiduous watchfulness on the part of the attendant; as indiscretions of any sort are only too liable to be followed by intercurrent complications of an unfavourable character.

It is unnecessary to allude to the advantage to be gained in respiratory gymnastics by graduated exercise after each and every removal of pleural effusion. Inhalation of compressed air, afforded by the cabinet treatment, and residence in high elevations, offer admirable opportunity for indulging in such lung exercise, and are considerations in the after treatment of these cases, of too great importance to be neglected.

In conclusion, permit me to express my high appreciation of your patience and attention.

DISCUSSION.

Dr. J. G. Truax said if he took exception to the paper it would be in that part treating of the diagnosis of pleurisy. In speaking of the friction sound the author had said that we could differentiate between pneumonia and pleurisy by the distance of the sound from the chest wall. It was true that this remark was modified subsequently in the paper, but as it stood originally it could not be considered as a reliable diagnostic sign. One obvious reason would be that the diaphragm might be the seat of the pleurisy, and then the crepitation would necessarily be distant. Again, if the peripheral part of the lung were the seat of pneumonia, the crepitant râle would be heard very near the surface.

Dr. Marcy said that he could not speak authoritatively on this subject and yet, as he had been a private pupil of Dr. Bowditch, he could not but think that the older teaching was better than the modern. Probably none of the younger men could for a moment understand the seriousness of the question as it seemed to this really great discovery. Dr. Bowditch had described to him on several occasions the great trepidation he had experienced in the first cases he had seen, in which it had seemed to him that death was imminent, from the quantity of fluid in the pleural cavity alone; and yet recollecting what the older masters had said about the dangers and difficulties of removing this fluid, he had hesitated to do so. It was at this time that he had devised the Bowditch pump, which was the precursor of our ordinary aspirator. The contents of his pump was the measure of its aspirating capacity. It had, however, a cut-off device which permitted of emptying the syringe without the possibility of regurgitation into the chest. In 1870 the speaker said he had been a special pupil of the great clinical teacher, Frerichs, of Berlin, and he

had told him of three hundred and seventy cases of thoracentesis so brilliantly treated by Dr. Bowditch. It was new to Frerichs, and he listened attentively. The outcome of this conversation was a long discussion before his class, which he finally closed by saying that the question was beset by so many difficulties that he did not feel quite able to master the situation as yet. There were two or three things, however, which Dr. Bowditch and Dr. Wyman learned from clinical experience, and which they considered of importance. The first was, not to operate when the acute fever of the disease still existed; the other was, that it was important not to remove all the fluid, so that the residual fluid would act as a sort of cushion to the inflamed pleura. It seemed now pretty clear that if the fluids were perfectly aseptic, its aseptic removal rendered the operation of thoracentesis a safe one.

The experience of early days was also of value regarding the removal of purulent fluid. Dr. Bowditch should be credited with the irrigation of the pleural cavity by boiled water or hot water containing various salines. We were apt to forget, at the present day, the monumental labours of these great masters.

He hoped he would be pardoned if he called attention incidentally to Dr. Bowditch's labours regarding the dissemination of tuberculosis in the state of Massachusetts. He charted the entire state, and located the cases of consumption that had occurred for a considerable period in all the towns and cities of the state. If this great master had been here this afternoon he would have been glad to have learned of the continuance of these labours, and of their probably greater fruition in the near future.

Dr. Cronyn said that he wished to call attention again to the fact that crude opium was much more curative than morphia. He retained this old-fogyism, although he kept well abreast of the times. He thought young men did not read the older books sufficiently. The newer books contained much superficial observation—much reflection and little experience.

The dangers so much feared in connection with aspiration were entirely attributable to want of care. Any one familiar with the anatomy of the chest should be able to aspirate safely at all times. While the acute fever was high it should be remembered that there was nothing to aspirate, but that the moment the friction sounds subsided, fluid was poured out, and the temperature was reduced, and then before there was much fluid in the chest aspiration could be performed. It was his custom to teach his pupils to aspirate before there was more than a pint of fluid in the chest. Before aspiration had been known he had opened the chest in the valvular manner alluded to by the author. The young men knew all about operative measures, but it was medication that they were not familiar with.

Dr. WHITE, in closing the discussion, said regarding the remarks made by Dr. Truax about the characteristics of the crepitation of pneumonia, that it seemed to him that the practised ear would readily detect the differences mentioned in the paper. In pleuritis there was a peculiar sharpness and clearness about the friction sound that he thought was characteristic of the crepitation found in that condition.

Dr. Cronyn had somewhat misunderstood him. He had suggested the hypodermic use of morphia in order to quickly relieve the pain and determine whether the case was one of pleurodynia or of pleurisy. Ordinarily he made use of Dover's powder to relieve the pain.

THE TREATMENT OF RETINITIS ALBUMINURICA IN PREGNANCY FROM AN ETHICAL STANDPOINT.

By Frank Van Fleet, M. D., of New York County.

October 10, 1894.

It is one of the privileges man enjoys in this world that he can change his opinion. A few years ago in an article on the subject of "Retinitis Albuminurica in Pregnancy" (*New York Medical Journal*, September 26, 1891), I advocated the induction of premature delivery in all cases of pregnancy where Bright's disease was present, no matter at what stage.

I am convinced that from the standpoint of the physician whose only object is to save human life, no matter at what cost, the advice I gave, which is the advice given by most specialists, is good. Since writing the article referred to, a new phase of the subject has been presented to me, and I have been forced to consider the matter in a broader light, which has caused me to ask myself if that advice was just.

Within the past year a patient has presented herself to me because of failing vision. The patient was the wife of a laborer and the mother of six children, all of whom were healthy. Mrs. D. was herself, ordinarily, a very healthy woman. At least she had always been so considered. She had never had any serious illness; her confinements had always been normal; but in this, her seventh pregnancy, she had been feeling badly all the time. Her sight had been failing for about a month. An examination of her eyes revealed myopia, and, in addition, neuro-retinitis with marked haemorrhages, and the white plaques characteristic of retinitis albuminurica. The urine was loaded with albumen, and under the microscope showed numerous granular and hyaline casts. I advised the immediate induction of labour.

The attending physician, a very able man, had already recognised the condition but could not agree with me, preferring to treat the disease and await developments. Two days after this decision the patient miscarried, having a dead-born baby.

The condition of the eyes improved, inasmuch as the active process subsided. Incomplete atrophy of the optic nerves was the result, with vision of two fifths.

February 10, 1894, exactly five months after the miscarriage, the patient presented herself to me again, saying that she was two months pregnant, and begged me to advise her what to do, as she feared her eyes were again affected. An ophthalmoscopic examination revealed neuro-retinitis with haemorrhages. I referred her to her family physician. She said that he was treating her and recognised the condition, but that both he and she were members of the Roman Catholic church, and that, according to the teachings of their church, the production of an abortion would be an unpardonable sin. I confess that this opened to me a field of which I had no knowledge and to which I had given no thought.

A little deliberation showed me that my ignorance was not at all to be wondered at and not at all strange. The teaching of physicians, the very nature of their practice, the discussion of medical subjects, and all, tend only to the study of the detection, cause, and cure of disease. Most of us are so taken up with these considerations that the study of ethics is something to which we give but little or any thought, and consequently know little if anything about.

But, as I say, this phase of the subject was new to me, and desiring to know more about it I communicated with a prominent clergyman of the Roman church, the Rev. Archbishop Corrigan. He very kindly gave me all the knowledge he possessed on the subject, and through his influence I was enabled to get further information from the Rev. Father Spillane, of St. Francis Xavier college, who put at my disposal the literature the college possessed, and to whom I owe my sincere thanks for his kindness.

I was somewhat disappointed to find that nothing on the subject has ever been written. On craniotomy much has been written, and the stand taken by the church is very decided; and, it seems to me, there is much to be said, in these days of advanced medical science, in favour of the arguments employed.

On the specific question of whether one is justified in sacrificing the life of a babe unborn, to save the sight of the mother, nothing has been said, excepting the general assertion that, in accordance with the principles of Catholic teaching, the direct taking away of innocent life is never permitted. The reason is the same as that advanced as an objection to craniotomy. It takes away from the child the chance of baptism.

Considered, therefore, from the standpoint of the doctrine of the Roman church, this is the only consistent conclusion its followers can come to. In other religious denominations where the baptism of infants is not, perhaps, considered of vital importance, the opinion of the justification of producing an abortion to save life is much more favourable to the mother, as might be expected.

The clergymen of various denominations to whom I referred for an expression of opinion, took, as a rule, very intelligent views of the subject. One only refused to discuss the matter at all. The rest, without exception, were of the opinion that when the question was the life of the mother or that of the child, the mother should be given the benefit. Some even thought that if the mother was threatened with blindness which might be avoided by destroying the child, then the sight should be given the first consideration. My friend, the Rev. Dr. Ferdinand C. Iglebart, while agreeing that the mother should be given the first choice if it came to a question of life, could not see it in the same light when the consideration was only the eyesight; giving it as his opinion that while blindness was a deplorable accident it could not be placed in value beside human life.

The legal aspect of this subject is very plain, and, in view of

the fact that many of us have advised the induction of labour for the simple reason of preserving sight, extremely interesting. It recognises the right of the mother to attempt to save her own life even at the sacrifice of the life of her child.

It makes not only the giver of drugs, etc., as well as the taker, but even the advising of the production of abortion, except it be to save life, a crime.

The penal code, section 190, is as follows:

The wilful killing of an unborn quick child, by any injury committed upon the person of the mother of such child, is manslaughter in the first degree.

And section 191 says,—

A person who provides, supplies, or administers to a woman, whether pregnant, or not, or who prescribes for, or advises, or procures a woman, to take any medicine, drug, or substance, or who uses or employs, or causes to be used or employed, any instrument or other means, with intent to procure the miscarriage of a woman, unless the same is necessary to preserve her life, in case of the death of the woman, or of any quick child of which she is pregnant, is thereby produced, is guilty of manslaughter in the first degree.

Section 194 applies to a woman on whom a miscarriage is attempted, and is as follows:

A woman quick with child, who takes, or uses, or submits to the use of any drug, medicine, or substance, or any instrument, or other means, with intent to procure her own miscarriage, unless the same is necessary to preserve her own life, or that of the child whereof she is pregnant, if the death of such child is thereby produced, is guilty of manslaughter in the second degree.

Sections 294 and 295 sum up the preceding sections, and give the punishment that can be inflicted on the parties concerned in the production of a miscarriage. In the case of a physician, the fact of having produced an abortion is not a greater crime than the advising of the same. It defines abortion as consisting as much in the advising as in the accomplishment of the act. The section is as follows:

SECTION 294. *Abortion Defined.*—A person who, with intent thereby to procure the miscarriage of a woman, unless the same is necessary to preserve the life of the woman or of the child with which she is preg-

nant, either (1) prescribes, supplies, or administers to a woman, whether she be pregnant or not, or advises or causes a woman to take any medicine, drug, or substance; or (2) uses, or causes to be used, any instrument or other means, is guilty of abortion, and is punishable by imprisonment in a state prison for not more than four years, or in a county jail for not more than one year.

In the case of the woman the crime is as great, and is as follows:

Section 295. A pregnant woman, who takes any medicine, drug, or substance, or uses or submits to the use of any instrument or other means, with intent thereby to produce her own miscarriage, unless the same is necessary to save her life or that of the child whereof she is pregnant, is punishable by imprisonment for not less than one year nor more than four years.

We see from these sections which I have copied verbatim from the New York Penal Code, Rust, 1893, and from information derived from Walker H. Clark, counsel to the corporation, New York city, and from Bartow Weeks, Esq., assistant district attorney, to both of whom I desire to express my thanks, that the law recognises only one just cause for the advising or producing of abortion: and that is the saving of human life. It makes no difference whether it is the life of the mother or the child; if either be in danger abortion is justifiable.

There is a point here I desire to emphasise, and that is that the advising is as great a crime as the production of abortion, and the advising, even if the woman should not be pregnant, is the same.

The law has never considered the advisability of producing abortion to save sight, evidently considering, if it gave thought to the matter at all, that while blindness as a result of pregnancy is a deplorable accident, it is not in itself sufficient cause for the destruction of the unborn babe's life.

As a matter of fact, however, we know that when a pregnant woman is threatened with blindness from retinitis albumenurica, she is also threatened with death from nephritis, and that the advice given can be justified from that stand-

point; but it is well to remember that the law will not recognise blindness alone as enough.

But, aside from the law, treating the matter entirely from a moral standpoint, and by moral I do not in any sense mean religious, have we, as physicians, any right to destroy the life of one person to save the eyesight or even the life of another? No single individual can decide a question of ethics to the satisfaction of the world at large. The acceptance or rejection of his decision will depend on the standard of morality of his fellows. Some are swayed by sentiment, some by justice alone, a third by self-interest, and so on. I do not propose to decide for you the subject I present—indeed, I am not certain that I have decided it to my own satisfaction as yet—but will endeavour to present for consideration the different sides of the question as they appear to me, and let you decide for yourselves.

We shall have to divide the subject matter in hand into two parts, namely: (1) the right of the individual, and (2) the right of the family. The individual side will be (1) the mother, and (2) the child.

A female enters into the act of coition with impregnation as the inevitable consequence. We recognise that some women may be sterile, and that others may resort to measures to prevent impregnation. When we say that impregnation is inevitable, we of course eliminate these conditions as abnormal. Normally every woman considers impregnation as inevitable. She also looks on death as possible.

Death occurring as the result of pregnancy is, as we know, infrequent, but women, as a rule, overestimate its frequency, and consider these two results,—pregnancy as inevitable, and death as possible. The individual side, as concerns the mother, therefore, is this: Entering of her own volition into an act, the consequences of which are tolerably clear, how far does her right to save her own life, if it should become endangered, extend?

Self preservation is the first law of nature. And we can understand how the mother, with this object in view, might

destroy her offspring. The law gives to anyone the right to take human life in self defense. But does this really come under this head? The moral or legal right of a mother to take the life of her child after its birth to save herself, say from death by starvation, would not, I think, be admitted. Should she, then, be allowed to take this innocent life before its birth to save her own?

During the act of coition the male organ discharges into the female organ a large number of spermatozoa. Many of these are lost. Some, however, passing up into the uterus, and so into the fallopian tubes, come in contact with the ovum. A few penetrate the vitelline membrane, but of these perhaps only one goes to make up the amount necessary to impregnate the ovum. The rest are cast off. The ovum itself may be lost, and the act be a failure. There is of course no individual existence here. The necessary elements are present, but their union does not take place under conditions favourable for their performing their proper functions. But let this ovum settle on fertile soil, enclosing in itself the spermatozoad, and when the first segmentation takes place this individual has begun its existence. It is not capable of separate existence, it is true, nor will it be when it leaves its mother's womb; but it is the same child, who, some months hence, will be exhibited to admiring friends, wrapped in swaddling clothes. Is there any reason why the laws for its protection should not be applied as well at one time as at another? Are its rights not the same at one period of its existence as at another? Although its outline at the earliest period is not that of the fully developed child, it lives, and if allowed to mature will come forth in the form of a human being. Should its life be made to answer for the result of a contract in which it had no part? On the other hand, it may be said that the possibility of a child surviving a mother afflicted with nephritis as a complication to pregnancy is so slight that we are justified in disregarding it entirely. This, however, can hardly be said to be a justifiable argument, because it disregards entirely the right of the few who may survive.

Retinitis as the result of the nephritis of pregnancy is a late symptom. That is, it means an advanced stage of the disease whether it be acute or chronic.

It means that the accumulation of effete material which the kidneys are unable to eliminate has become so great that not only is the blood altered, being sufficiently irritating to produce inflammation of the optic nerve and retina, but even the blood vessels themselves had become so altered and weakened by disease that they rupture.

Happening in the early stages of pregnancy, such a condition means the death of the foetus and spontaneous abortion. If this occurs soon enough the mother may be saved. The longer it is deferred of course the greater the pathological change, and the chances of recovery are accordingly diminished. Notwithstanding the impoverished and poisoned condition of the blood, which can nourish the foetus but poorly at best, some of them do live on to a period when they can exist outside the mother's womb, only to drag on a miserable existence of a few weeks or months, and finally succumb to malnutrition. But, even under these most adverse circumstances, a child will occasionally live and become healthy. I have just such a case in mind at present.

A woman of over thirty years, in her first pregnancy, began to show symptoms of nephritis, became totally blind, and terminated her pregnancy in convulsions and died, giving birth to a female child. The baby was puny, and remained delicate for two or three years, but is now strong and apparently healthy. The attending physician in this case was severely criticised by the family and friends for not sacrificing the life of the child to save the mother from death, as I believe he might easily have done. In fact in my own mind I criticised him myself. But later thought has caused me to ask myself if the justness of the law, which gives to a physician the right to decide to destroy one life to save another, is not questionable? Who shall say that the life of this child is not as valuable as that of the mother who died?

Many women in this and other cities wear themselves out

and die in order that their children may live; but no one would say that a mother should have the privilege of killing one or more of her children in order that she might not have to work herself to death to support them. It must be doubtful if one human life should ever be taken to save that of another.

In the case of the family of the pregnant woman with retinitis albuminurica, I refer again to the patient mentioned in the beginning of my paper, Mrs. D., the wife of a poor man and the mother of several small children. A continuance of her trouble would have meant blindness total and permanent, —a few of these cases only, regaining even a portion of their lost vision,—and perhaps death.

Death would have meant that these children already born would have been neglected. They would have lost the trainer of their childhood, whose early training would have had much to do with the course of their adult life. The father, being too poor to hire anyone to look after them and unable to care for them himself, would have been obliged to either let them grow up wild, like weeds, or send them to some charitable institution. People do sometimes, but I think rarely, rise superior to their environment. These children from neglect and without a mother's watchful care would become perhaps degraded and criminal. Blindness on the part of the mother, while not so far reaching in its deleterious effects as death, would still have the same result though in a modified form. Should these children and the community in which they live take precedence to the unborn babe?

One of the fundamental laws for the preservation of society is the protection of the many, and as there is here a being whose continued existence may interfere with the comfort and happiness of its fellows, we might say that the greatest good would be conferred on the greatest number by the destruction of this life; therefore destroy it. This argument, if carried out to its logical conclusion, would work inestimable harm, to say nothing of its gross injustice if applied generally.

This foetus, as I have said before, while not capable of

separate existence, is still an individual, and if what religions generally teach be true, it is the undoubted intent of the Supreme Creator that this being shall be one of the inhabitants of the universe, endowed with an immortality. Its right, therefore, from the time it begins its existence should be the same as those of any child, who, having passed through the normal period of intra-uterine life, is born fully developed.

But aside from the right of the unborn child to be protected, we can never tell exactly what we may do to the community at large when we advise the induction of premature labour and the destruction of the foetus.

If we agree with the doctrine of predestination we can see that by this act we may be putting obstacles in the way to block the design of creation. At any rate we can never tell what we may have done besides the fact of having saved a woman's life. In times of great crises in the world's history men have risen from the most unexpected sources, who have, with a master's hand, smoothed out rough places and readjusted the affairs of governments. Who can tell but that the child we seek to destroy may not have in his makeup some peculiar quality which would make him perhaps a leader of men? On the other hand, we may rid the world of one who would have been a source of trouble.

If might makes right, then no matter what may be the ethical right of the subject, if the law-makers say that it shall be legal to destroy the life of an unborn child to save the life of the mother, the simple fact of making a law to that effect justifies the course of procedure from a legal standpoint. This is one of the instances where justice is blind only as regards the individual rights of the unborn.

One point I have mentioned before I desire to repeat, and that is, that although the law gives to a mother the right to save her own life, even at the sacrifice of her child's, and also gives to the physician the right to aid her in this particular, it gives her no right to attempt an abortion to save her eyesight, and makes it a crime for a physician to even advise it for this purpose.

The penal code, as it reads, at least so it seems to me, while making it legal to produce abortion in order to save life, also makes it impossible to convict a person for producing criminal abortion.

We are taught in medical schools never to advise the induction of premature labour unless we first consult with our *confrères*, and have had a consensus of opinion. But although this advice is good and is probably followed by all physicians at all careful of their reputations it is not obligatory.

If a physician, without consultation, produces an abortion, and swears that, to the best of his knowledge and belief, such an action was necessary to save his patient's life, who shall gainsay him? True, it might be said and proven, that the woman's life was not in danger, that beyond pregnancy there was present nothing which jeopardised her life, yet if he were to say that an examination of her urine revealed to him the presence of albumen and casts, either or both of which might exist within physiological limits, and that in his opinion she would have died of nephritis if allowed to go on, he would be justified under the law in producing abortion. Perjury would not stand in the way of a man who would commit a deliberate murder.

The people have a right to make laws which suit themselves and which no doubt seem to them to be in the best interests of the largest number, but that there is any good reason why the murder of an innocent infant should be allowed to save a woman's life, and not allowed when her sight is threatened with destruction, I cannot admit. Certainly among intelligent people, if they had to choose between blindness and death, the majority would choose death.

Whether we have any moral right to say that abortion with the inevitable destruction of the life of the foetus should ever be allowed, for any cause whatever, I leave for you to decide.

DISCUSSION.

Dr. D. Colvin said that the transactions of this association for last year contained a report which he had made of a case in which there was precisely the same state of affairs. In brief, her history was that seven or eight years before he saw her there had been a nephritis during pregnancy, and when confined she had had convulsions and had lost the child. In the next pregnancy the speaker had been consulted with reference to her. She was then becoming blind, and there was some anasarca, although she was not far advanced in pregnancy. From the condition of the kidneys and the threatened blindness, it seemed to him that death was inevitable unless something was done. He did not know the law and did not care. He advised the immediate termination of pregnancy, but this was not acceded to. He again saw her about one month before full term. The anasarca was then great, and she was totally blind. The advice was given that she should be freely bled if they would not consent to anything further. This was done, and repeated about two weeks later. She went through labour without any trouble and had a living child. She was totally blind for about a month, and at the end of a year still suffered from defective vision. He wished to insist upon this point of having a living child, because he thought that the author had implied that the death of the child was inevitable. He had known of two other instances in which there was nephritis, and in which a living child had been born. He had understood that according to the present law the procurement of an abortion at any time in pregnancy was a crime—whether or not the foetus was viable. He had had a priest stand at his side when he had intended to sacrifice the life of the child to save the mother, and had had the priest tell him that he must not do it. He had therefore retired from the case as the priest had persisted in forbidding the sacrifice of the child's life.

Dr. E. D. Ferguson said that the ethical questions involved would have to be settled by all the conscientious consideration the parties concerned could bring to bear, and the legal liability would be settled by the state. He thought there was still a distinction remaining on the statute books as to the period when an abortion might be procured—as to whether the woman was "quick" with child. The lawyers would apply this in determining the grade of the offense before the law. There could be no question, however, that the physician was liable at any time during pregnancy before the law, if an abortion was performed. Fortunately, at the present time this question could not often arise, for by surgical and therapeutic measures a division of the risk might be made, and a choice of destruction of life need very rarely occur. We must, however, make a broad distinction between abortion and premature delivery, and whatever our individual judgment as physicians might

be as to the probabilities of increasing the number of viable children by premature delivery, the fact still remained that in the opinion of the majority of physicians an increased chance of life might be given to the child by premature delivery, and at the same time greatly increased chances of life be given to the mother. This was, of course, stated with the understanding that the premature delivery be conducted in a thoroughly scientific way, otherwise the probabilities were that the premature delivery would considerably increase the risk to the mother.

Dr. CRONYN said that the paper was a most important one. The ethical phase had been very well put, and the Catholic church drew a line which could be scientifically and successfully used in all such instances. This church would permit the performance of caesarean section, notwithstanding its dangers, inasmuch as it could be assumed that the child could be born alive, and that the risk to the mother was not extreme. The church also consented to the performance of premature labour provided the child was viable. Again, it should be remembered that the child could be baptised *in utero*, and then the forceps could be applied. The child must be baptised on the head if it were already born, but *in utero* there was no objection to baptising it on the feet. The church objected to any interference whatever before the child's viability. Regarding this question of blindness and sacrificing a child's life, he was convinced that the ethics of any church would forbid it. He had delivered a woman, now sixty-five years of age, of a number of children. In each pregnancy there had been anasarca, albuminuria and partial blindness, and convulsions at the time of labour. During the puerperium she would regain her vision. The last time he had anticipated these troubles by administering benzoic acid, and by giving large doses of croton oil. The word "quick," as used in law, was intended to refer to that period in which the woman "felt life." He thought the paper was admirable and well elucidated the subject.

Dr. COLVIN asked if he understood that they were not to deliver the woman if it was at the expense of the child.

Dr. CRONYN replied in the affirmative.

Dr. COLVIN said that twenty years ago he had been called to see a woman supposed to be dying in her confinement. She died within five or ten minutes after his arrival. The attending physician stated that suddenly the pains had ceased and that he could not understand why she had died. The husband refused to allow him to examine the dead woman. He then sent for the priest and stated the circumstances to him, and also told him that it was of great importance to medical science to have an autopsy. The priest immediately replied that it must

be done as he must have the child. An autopsy was made and the dead child removed.

Dr. CRONYN said that the explanation was that the priest thought there was a possibility of the child being alive. Not long ago a physician in Buffalo had made himself famous among the Catholic clergy by performing caesarean section with his pocket knife and removing a living child.

Dr. E. D. FERGUSON said that he believed that this whole subject had been first thoroughly considered and settled by the doctors of Sorbonne in Paris, something like three or four hundred years ago.

Dr. T. C. CHURCH said that he rarely, if ever, applied the forceps without baptising the child *in utero*. Bishop O'Hara had told him that in baptising the unborn child he should say: "If living, I baptise thee in the name of the Father, in the name of the Son, and of the Holy Ghost." It was done with a syringe *in utero*.

Dr. T. C. HANNAN, of Rensselaer county, said he wished to express his admiration of the very able and scholarly paper just presented. He was also interested in noticing the sentiment expressed in this meeting, and comparing it with the derisive way in which this same subject had been treated some years ago in another gathering. He hailed the present sentiment as an indication of the tendency of Christian people to break down the ugly barriers that had kept kindly hearts asunder for centuries.

The speaker then referred to a case occurring in his practise in Albany. He had been called to see a lady in confinement, and after a number of hours of tedious labour, he had called the professor of obstetrics in the Albany medical college to assist him. The professor, after examination, had told him that the child could not be delivered alive, and that craniotomy was necessary. The priest was sent for, and on his arrival, he asked if the baby was still alive. The speaker replied that he thought so, but the consultant was doubtful on this point. The priest then refused to allow craniotomy to be performed. This same professor, who was a deacon in an Evangelical church, said at the time that he did not count an unborn infant's life better than a worm. The professor then left the house. After some hours without much advance, the speaker gave a full dose of opium, and after a good sleep the pains returned with great vigour, and a bouncing boy was soon brought unaided into the world. In this case this beautiful boy might have been murdered if the consultant had had his way. It seemed to him that moral ethics and medical ethics should not differ at all, but truth was truth so long as we lived. As long as we were a nation professing

the principles of Christianity, he thought we should give moral ethics the preference where there was a life at stake.

Dr. Van Fleet, in closing the discussion, said that he had not intended to start a religious discussion. It was very difficult to separate religion and ethics, although they were certainly separable. The first ten years of his medical career had been in general practise, and he had seen many cases of obstetrics during that time. He had made it a rule to baptise Catholic children before they were born, and he had been told by a Catholic clergyman that he was right in so doing. Bartow S. Weeks and Corporation Council Clark had given him the legal information mentioned in the paper. He had found no distinction made in the law between abortion, miscarriage, and premature delivery. There was one word, "abortion," and it was not the act of abortion but the intention of producing abortion which constituted the crime.

ADDRESS: THE GENESIS OF DISCOVERY.

By John Shrady, M. D., of New York County.

October 10, 1894.

As man improved his condition and pitted his dawning intellect against brute force in response to the law of self-preservation, his intellect became more alert. Knowing the limit of his power, he resorted to subterfuge. He thus unconsciously learned the point of least resistance, and called in extraneous aids. With the first of his classifications of forces were tools and weapons, which followed soon after the various devices for protection against varying temperatures. From being a mere animal with a larger brain, gained at the expense of the special senses, he became an organiser of inferior forces, a coördinator of component elements, and thus made the most of his capacities for a given effect. Stimulated by the obstacles he was compelled to overcome, his brain grew not apace but slowly, since there was too great a waste by reason of the lavish fritterings of too many tasks imposed with no more definite object than the continuance of his existence. There was much individuality at the start, untoned by the spirit of concession or compromise. All this, however, was corrected as the multiplication of his comforts resulted from blind gains here and there. Next he assorted his wares and exchanged both wares and ideas in pantomime and intoned gutturals. Gregarious, and the common enemy of the rest of the animal kingdom, he soon discovered the value of combination—almost as soon as he tottered upwards upon his haunches and defiantly stood erect with the brain as the minaret of his aroused comprehension of his environments.

What was at first the mere herd became the clan and then the community, carrying, fortunately, through all the vary-

ing changes, the family idea as the basis. Wants multiplied, and sacrifices were bartered for still greater comforts, each generation adding somewhat to the capital of the next. Communal combinations and the division of labour spurred on to the still greater industrial efforts, with the same mannerism and the same uniformity. The jealousies of conflicting interests keeping in abeyance the tendency to reversion, with the same old alternative of slaughter or starvation, and demanding larger territories for expansion. In a military sense, there was the same deploy on the skirmish line and the same rally on the rear—the same display of force and the same strategy.

From families to classes, with the assignment of special vocations to selected individuals, there were not many steps, but the gains were substantial. The communities which were the outgrowth of these affinities and these tendencies to segmentation became a spur to industrial efforts on a larger scale and a more definite basis. A spirit of compromise began to prevail and lessons of combination to be taught, with the development of noiseless advances all along the line. The human machine, with diminished friction, was in train for a higher rate of speed,—there was the same constant work, but not the same direction.

In the descent from the conjectural to the real what first engages the attention is the almost illimitable devices for the prolongation of life. The more palpable dangers of termination such as result from the flow of blood were easily averted by ready pressure or artificial closure, but for ages there was an awe and mystery surrounding physical structure. Men were attracted and then appalled while they were moving along the zig-zag lines of confused investigation. An understanding—an idea coming in a flash after what seemed a long and bootless moping, soon convinced this early philosophical class that knowledge came neither by intuition nor yet by inspiration. Here and there in communities, even amid such as were always confronted by the problem of sustaining mere existence, there loomed up the dreamer of ingenious

devices, who by the clustering together of resemblances approached the origin of a law, by dint of a fixed gaze.

Humanity in leisure, with its simple wants supplied, without the stimulus of pioneer life soon betakes itself to dreaming of physical advancement, and ingenious devices by the clustering together of resemblances for the formulation of laws. With its comprehension of the inevitable doom of limitation and unfulfilled ambitions, it projects its power into the obscure future and then casts about for the comforts of the present. It diminishes as far as compatible with the friction of life, the drive of the machinery which crushes with a brute force and perhaps works with gayety as a safety-valve for the dreaded monotony. For the perfection of its work, there is a radiation of effort, but the focus is somewhere. No invention or discovery springs into life with perfect appointments and with no suggestions of other minds for extensions of principles or applications. There in reality can be no theory without a germ of fact,—there can be no advance without a correction of the refraction. The revelations of astronomy have been mostly due to disturbed orbits detected by the lens, disposed in a series and dealing with the problem of concentrating, enlarging, and separating the rays of light. How vast has become the domain of vision thus artificially increased by the instrument which sweeps the skies! How important the additions to knowledge by the microscope, constructed on precisely the same principles, but dealing with the infinitesimal field of atoms and impalpable forms! This same straight line with its piercing end shadowed and left to surmise has proved to be the elementary expression in logic, mathematics, and in perspective, but made nowhere intrusively prominent. It is the wedge of entrance to them all—united in a series at the apex, it rives the oak and rends the compact square of a nation's legions, but nevertheless, as has already been surmised, it may escape the keen eye inasmuch as it is the province of art to conceal art. No one particular searcher seems to have directed attention to this linear principle in the analysis of

the laws of sound—it may have had its origin in the hollow-hand of the savage and it may have expanded in the herdman's horn along with the after prolongation by electrical aid into the triumphs of Edison.

Here need it be said that the human brain is still a focus, with rays of its own for future garnering; but as force does not always require stimulation, it not inaptly betakes itself to repose, that it may by pausing adorn its acquisition before it abandons it as a toy. Perhaps humanity prefers to linger rather than pursue; perhaps it yearns for the camp rather than for the fray. Perhaps the query, "Are we not automata?" is the measure of its destiny and the climax of its hopes. Often is it said that there are exceptions to all rules, but is it not better to concede that the law may not be sufficiently comprehensive? May there not be need of a reinvestigation, as when Pasteur, puzzled by his reactions, sponged his slate and began anew, to end as the uncrowned founder of bacteriology. Still, with all these mimic cries of life struggles, there came corroboration rather than novelties. There was yet a noting of similitudes, an unconscious study of general principles, a memorisation by monuments, and a garnering up of symbols. There was a divination of the principle, but a bewilderment over the application. The circles were enlarging because the sweeping points were separating by advancing along a radius, straight, direct, and leaving an effectual trace. Humanity was beginning to be discontented with the cave and forest; there was something between it and the howling wolves yearning and snarling for their pound of flesh. There came therefor the spectral enlargement against the murky sky and the gorgeous hue of prismatic dissections,—the possibilities but not the realisation; the dream of symmetry and the phantasm of poetic justice; the laurel crown for purity of motive, and the jewelled-eyed dragon before the poised spear of St. George, as the fruition of vanquished wrong.

As is natural, humanity took an early interest in the palpable—in what concerned itself and immediate surround-

ings,—keeping its problem close under the eye. It must needs prolong life, mitigate pain, and war against extinction. Thus the food suppliers, the care-takers, and the destroying heroes came in along with the very dawn of civilisation. Is violence done to reason by the surmise that the physician was largely a pre-historic figure, for along with the teachers and philosophers came the physicians, who were required to make practical application of all knowledge and to amalgamate all facts. Success with them, of course, was neither satisfactory nor complete, because humanity is loath to yield up the traditions and myths of its infancy. It will look back, even though it became a pillar of salt; it will ever fondly cherish its memories rather than attempt the new, so that in Lot's small company even the love of God and the pride of opinion went hand in hand. Nay, more: were not all, in a rude sense, concerned with the problems of life in material form? Were they not very close to the focus, and were they not balancing on the scintillating rays? Were they not collecting facts for future systems, blindly but effectually? Were not allegories, personifications, and proverbs concentrating into fables and folk-lore? In a word, were not the lines shorter but just as direct between the two points.

For the sake of identification humanity was forever seeking a form, whose changes might be captured by the eye. It was classifying, without impeachment of Solomon's wisdom regarding the new. There was the same demand and the same supply, the same effacement and the same replacement, the same Vandal invasion and the same convenient camping grounds; the same deaths and the same legacies. As seed seeks its soil in the end to exhaust it by a prodigal prolificness, so in turn does the germ exchange its short life for a long line of descendants, whose mission is to repeat the oft-told tales of triumph and extinction. It were well that there were no battle for carnage oft overleaps itself, that there were no conversions, that there might be no extermination, that there were no life that there might be no pesti-

lence, that there were no forests that there might be no fires, that there were no seas that there might be no shipwrecks, that there were no life that death might have no empire but in this mundane economy of nature there must needs be a re-arrangement of atoms and the old reciprocity between the organic and the inorganic, movement and crystallisation. Emanations from self-study kept ever coming until the grand law of the union of centripetal and centrifugal forces suggested the circuit of orbits, the course of the blood, the compromise of society and the ultimate law of compensation. The microcosm or world in miniature is read between the lines of the laws which govern the spheres with the same unerring analogies of universal adaptation. The microbe with a shorter life in common with the mammoth goes through the same struggles, the same reproduction, the same experience, and the same doom with the same futility of destruction. The same logic with the same deductions is destined to prevail. Thus all discoveries present newer forms, but nevertheless not newer laws. There is the same inevitable, irrepressible conflict between labour and reward, between battle and victory, between the plough and the soil, between a longer life and an easier death. The same strife after the ideal ends only in the procurement of an average and the conviction that the dot is but the centre of converging lines—that the nucleus by the revolution around its pivot has grown into a circle. Form gives more palpable figures but reflecting itself upon the immaterial with its memories of occurrences, originates ideas suggestive of greater possibilities, not by the extinction of work, but by the increase of speed. A catalogue of great discoveries cannot be written as most are nebulous and undiscernible by reason of the haziness of the halo. There are many thin and piping melodies yet discordant, but the grand chorus can only die when the multitude has vanished amid the ruins of its own works.

Discovery is the cognisance of established actualities, while invention is the application and re-arrangement of

principles; the one is a power, the other a diagram; the one a germ, the other a growth; the one a crudity, the other a crystal. But for the other neither could exist. The form must be present, or the nucleus cannot gather its accretions: the point cannot grow into a line. By the aggregation of all these forces, original or extended, civilisation keeps ever advancing into space, dividing and conquering, trembling between homogeneity and disintegration, and still driving as a wedge its pioneers far into the van, changing maps and making countries by uniting individualities into nations, yea, verily, keeping the peace by the combination of interests. The fall of an apple, the antics of a tea-kettle lid, the spark of a Leyden jar, the swaying of a church chandelier, the arrangement of a pair of lenses in a boy's hands, and the evolution of the telephone from the trumpet, have revolutionised a sphere by keeping the line from warping, and thereby imparting directness to its force and clearness to its purpose.

As light first attracts the eye of the infant and after it form, so have been the discoveries along the line of these promoters of investigation. Civilisation began with their study and an inquiry into the wherefore of their existence. "Myself and my needs," sounded the keynote of the ages. "I comprehend, and how shall I apply," has ever since been the air. Out of these two actuating elements have sprung all the additions to knowledge, all the interpretations of the co-relations of chemical affinity, cohesion, electricity, light, heat, and magnetism. The catalogue is too long for quotation or transcription, and, indeed, what necessity is there for the association of puny names with interminable controversies? There must needs be contemporaneous discoveries, and perhaps unseemly conflicts over the equity of credit, but does not the explanation come from the fact that there is a curious psychology governed by immutable although inscrutable laws, just in conception but limited in enforcement? There may be a strange artist at the easel, and it were better that he originate rather than improve, since execution is

likely to distort the story sought to be told. Along that pellucid line, where the introspective and the extraneous cannot blend, where atoms, though invisible, may not be formless, intelligence cannot be otherwise than baffled by the contest between convergence and dispersion. Analogy can only fulfil its office, and that, too, without gathering up the official robes of dogmatism before advancing on parallel lines. Egyptian, Hebrew, Greek, and Roman civilisation made substantial advances in the study of ofttimes pseudo sciences, but there could be no other movement than from the circumference to the centre. The symbol of their comprehension may have been a dot, even an incomprehensible compound body, but its glitter was suggestive of at least the red ray, which is the nearest to the focus. At all times have there been suggestions of discoveries—seed-thoughts, as rhetoricians style them—approaches without capture, and much oftener the dying gaze upon the promised land. Sometimes the journey were pleasanter if the company were more numerous, and sometimes the discovery were more abiding if the record were clearer.

Amid that great multitudinous throng, recruited from all classes and nationalities, which is careful to distinguish between the aristocracy and the autocracy of intellect; in that procession where fact and not dogma is the eagle upon the banners, there can be no more conspicuous body than our own marching column, which has won so many laurels in incursion into fields other than their own. The roll of honour contains many names which the world even delights to honour, and justly too, for has not doubt begun in observation and ended in comparison, and has there not been proof upon proof that there is in all strictness no annihilation of matter but a re-arrangement of form? Let that column march ever in humility, for many are to be the repulses, many the blunders, and many the disasters. To each, "Well done, good and faithful servant!" is yet to be uttered, but the work must be worthy of the prize.

REMINISCENCES OF A COUNTRY DOCTOR DURING THE PAST FIFTY YEARS, INCLUDING THE CRUDE CONDITION OF AMERICAN MEDICAL LITERATURE AT THE BEGINNING OF THAT PERIOD.

By Darwin Colvin, M. D., of Wayne County.

October 11, 1894.

For presenting this paper on such an unusual subject, I shall offer no apology except for its length, for reasons which must be obvious to all; yet for errors in dates and other imperfections, should there be any, I give as a reason the fact that it was written in haste and entirely from memory.

To attempt a retrospect of that which the title of this paper indicates, in the few minutes allotted me, must necessarily result in an epitome extravagantly condensed.

For a "country doctor" to have practised the various branches of medicine for fifty consecutive years, is of infrequent occurrence, the reasons therefor being too well known to require an explanation.

As I sat down to write this paper, I was reminded of a communication which I had read in a respectable journal, the name of the author of which I cannot now recall (neither do I wish to), and in that communication the ignorant as well as excessively egotistical individual who added M. D. to his name, beside other silly assertions makes use of these words: "Country doctors do so little thinking as a rule."

Although "country doctors" need no defense, very soon after the paper was published and while the missiles of criticism were flying thick and fast about the author's defenseless head, a distinguished medical editor of an equally popu-

lar medical journal of this city, wrote an editorial in which he used the following language:

"When any writer presumptuously says that a country doctor never does any hard thinking, he has evidently never met even the average representative of that class. We modestly venture this assertion because we have seen the country doctor under all circumstances; have oftentimes worked with him in his own fields of practice; have been in communication with him in many other ways, and we believe we know the man; all other things being equal the only difference between the metropolitan and rural practitioner is in the surroundings. The former is in a position to have plenty of help and very many if need be to think for him; the latter is generally alone in an emergency and has to do his own thinking. The country doctor's mental guy-ropes are his own experience and that of his marshaled authorities in his library. The metropolitan practitioner can, if he chooses, fasten the different tendrils of his web to the door-posts of all the experts and specialists in his neighbourhood," etc.

Much more and very pertinent might be quoted from the editorial, but I will not consume your time in doing so.

Let me add a word more relative to the country doctors doing "but little thinking," and that is this: If they do but "little thinking," of what use are their fine libraries? No one in a position to know can deny the statement that no larger and better selected libraries, with an occasional exception, can be found in the office of the metropolitan practitioner than can be seen in that of the "country doctor." I am sure that the much puffed up M. D. heretofore referred to will not say that the latter expends much of his hard earned income for books and journals merely for show, and not to aid him in doing his thinking.

Fifty years ago at the birth of the graduate in medicine, no silver spoon was observed in his mouth, and usually the bed of poverty in which he lay was immense in size. I shall assume that he has selected the country proper or some little hamlet wherein to begin his professional labours as an antago-

nist of death. At the time spoken of he was obliged to supply himself with medicines in bulk, as all, or nearly all, were the base or crude part of much of that which the present and more fortunate physicians are using in an eligible form.

People of that day were made of sterner stuff than are those of the present, as now, when sick, they seem to cultivate a convenient kind of gastric irritability, and shudder if their bedsides are approached with any agent more offensive than a medical electuary. Fluid extracts, elixirs, tablets, and coated pills were yet "high up in the womb of time," and there were but few solid extracts in use. The "country doctor" was obliged to make his pills, tinctures, unguents, etc., and he usually had plenty of time in which to do it and do it well at that, for had he not had three years' experience in the country preceptor's office? A pair of saddle-bags were absolutely necessary, as it required a handful of many medicinal agents at that time to make a decoction equal in strength to a fluid dram of the same agent at the present time. The pocket medicine case of the present day would have been more ornamental than useful.

A lancet (a much neglected instrument in these modern days), and if he was especially fortunate, a cheap pocket-case of instruments, and added to these, the inevitable turn-key, which was an additional necessity, for you must remember that not even country villages at that time included among their denizens an individual called a dentist. Hence, fractured teeth and comminuted alveolar processes were among the achievements of the young "country doctor." Next in order was his library, which, fortunately for his purse, could not be large so far as American publications were concerned.

There was one American work on anatomy—Horner's, one on physiology—Dunglison's, and one or two on practice—Dewees' and Eberle's, the latter being the standard work at the college where the writer received his medical instruction. A short time thereafter the valuable work of Wood was published.

On surgery, if I remember correctly, there was but one American work—that of Gibson, of Philadelphia, and one or two by foreign authors, edited by American surgeons. At some time (the period I cannot recall) Velpean's Surgery was edited by Mott, as well as Fergusson's by Norris.

There was but one standard American text-book on midwifery, and that was by Dewees.

On materia medica there was one (possibly two) work of an inferior character.

The United States Dispensatory may have been issued about that time, and if it had, its expense to the impecunious young "country doctor" would for a time have prevented its adorning the shelves of his infinitesimal library. These, if he was fortunate enough to obtain them all, constituted the American text-books in medicine fifty years ago.

To return for a moment to the saddle-bags: In them the young "country doctor" of fifty years ago was obliged to carry a bottle of castor oil; also a paper of pink and senna—the only known anthelmintic combination of that day—and it was in almost daily use, whether or not a necessity for it existed.

The young doctor was compelled to be a small peripatetic drug store, as there was no other in the smaller villages at that period. Occasionally, in the larger, there was found a dry goods store of considerable magnitude, in which would be found a keg of sulphate of magnesia, a bottle of paregoric, a jug of castor oil, and some laudanum, yet this was often quite remote from the "country doctor."

His turnkey was his constant companion by night as well as by day, as he was often hailed upon the highway to dismount and relieve someone of a tooth that was on the rampage. The writer has often done so for the inevitable shilling, and sometimes without it (consequently increasing the Lord's indebtedness to him), but he declines to say how many he has fractured, or how many alveolar processes he has comminuted in making this *capital* operation during the fifteen years' practice in that department of surgery. If there be

any "country doctor" of fifty years ago, whose lips are not voiceless nor his reason dethroned, who does not remember the joy he experienced over the victory in the successful extraction of the first recalcitrant tooth which came under the power of his turnkey, his amnesic condition is deplorable indeed. The atrocious torture which he inflicted by his coarse-hand work made it no less a triumph even in the estimation of his tortured victim, as the latter usually added greatly to the young doctor's comfort and happiness by his joyful expressions at being relieved of the cause of his suffering.

About this period, under the leadership of John D. Godman, the study of anatomy began to take on an increased interest, as all his dissections and demonstrations were made in the presence of his class, so that the relative situation of the parts should become familiar to the eye of the student as he proceeded with his dissections and demonstrations. The ornate Webster, whom every medical man in central and western New York at that time adored as a teacher, was a student of Godman's, and taught anatomy in the same manner.

The late Professor Ford and the writer were members of the same class at Geneva more than fifty years ago, and he seems to have caught the inspiration of Webster, and became, as you all know, a successful teacher of anatomy in many colleges for a great number of years,—teaching it as did Godman and Webster.

If any other teacher has, or does now, teach anatomy in that manner, I am ignorant of it. I remember but one American work on this subject at that time, and that was written by Horner, of Philadelphia.

The study of histology and microscopical anatomy had not been pursued in this country, although I believe Horner had injected a little of it into his work, but of the latter, and that of the eye, nothing had been published until ten or twelve years had passed. Fifteen or twenty years after, the classic work of Gray of London was published, which afforded

the medical men of this country all that was necessary save occasional dissections.

America had no investigators in physiology of prominence fifty years ago, and I believe there was but one work (American) on the subject, and that by Dunglison. England, France, and Germany were far in advance of America at that time.

In surgery, so far as text-books "Native, and to the manner born," were concerned, American surgeons had published but little, and what had been, save one, were not considered such fifty years ago. Gibson, professor of surgery in the university at Philadelphia, had published a work in two volumes which was the American text-book on that branch; although I well remember the portion devoted to fractures was never considered quite satisfactory.

Clinical teaching in any of the branches of medicine was unknown in this country, yet I believe the distinguished Mott, about this time established a surgical clinic in the university of this city.

Gross was scarcely known, and the elder Pancoast, although more prominent as a teacher of anatomy, was rapidly reaching out for fame as a Philadelphia surgeon, while Stevens, of this city, was considered the peer of Mott though not so bold. It was a common saying: "Let Stevens make the diagnosis and Mott do the cutting."

Hamilton had just begun that career which was to immortalise him as a writer on fractures and dislocations. The writer became acquainted with him soon after he had delivered his first course of lectures at Fairfield, at that time the only medical college in this state, west of the city of New York, yet none of these men who were to become so famous in surgery, had as yet published anything as a text-book. We had to follow closely the English and French surgeons, and were so taught. At that time Sir Astley Cooper as a surgeon towered high above all others. His works on surgery, hernia, and the female breast, were a library on surgery, yet I desire to confine myself, as much

as possible, to America,—its medical men and medical literature.

Save that of trepanning, brain surgery was unknown. Also, with the exception of paracentesis for hydrops, pericardii, and exsection of a portion of the rib in empyema, no great advance has been made in thoracic surgery.

Fifty years ago Lister was an obscure young surgeon in Edinburgh, and the idea that a wound could be made to heal without suppuration had not, nor for many years thereafter, yet entered the mind of man.

Equally as ridiculous would have been considered the theory of any bacteriologist, as such thoughts could have had no foundation, as a microscopist in medicine, save perhaps in the study of histology, and that not in this country, was unknown, except the little attention which Horner was giving it, but whose work never became popular.

Fifty years ago with the exception of McDowell and the Smiths (and they were considered mere adventurers), the abdominal cavity was looked upon as a sealed book. With the exception of cutting into the peritonaeum as a *dernier ressort* in a strangulated hernia, made so by this fear (which seemed to justify taxis *for many hours* previous to the operation), it was considered, if the phrase is justifiable, too sacred and unjustifiable for the scalpel. It was left for Lister to remove to London and there rouse the energies of the English surgeons twenty-five years thereafter, for the purpose of showing that the peritonaeum or any other portion of the organism was no more to be dreaded under antiseptic precautions than the walls of an abscess.

Then it was that abdominal surgery with meteoric splendor dawned, and was destined to a brilliant career; specialism by the name of gynaecology suddenly sprang into existence, and it was soon believed that the abdominal cavity was entitled to no deference—that fools might enter where hitherto angels had feared to tread, and that it could be as safely entered, and its contents roughly handled and given a bath, as to incise a felon.

But, as has always been the case, the pendulum of indiscretion soon began to swing too far, and much mischief was done, but, thanks to conservatism, it is now beginning to find its proper place.

Fifty years ago the attempt to remove a malignant growth within the abdominal cavity would have been considered a homicidal act, and yet, antisepis prompted the undaunted Billroth and subsequently others, to resect, and with success, the stomach, bladder, and portions of the intestines. In fact, without specifying farther, there is scarcely an operation within the abdominal cavity, in certain stages of the malady, that is not considered justifiable with antiseptic precautions.

The writer well remembers a meeting of his county society more than forty years ago when the subject of ovariotomy and the justification of the operation was under discussion, and when he made the prediction that eventually the operation would become so common that country doctors would make it, that one of its members, a rising young surgeon who was vehemently opposed to it, became very irascible at the remark. In the course of time that young man—the dearest medical friend the writer ever possessed, made the operation and lived to become one of that noble band of honest medical men—the founders of the New York State Medical Association. Alas, he has since crossed the dark river.

In the surgery of the eye wonderful advances have been made. Fifty years ago no American work had been published upon the diseases of this organ. There was an English work by Lawrence which was occasionally referred to. All diseases of that organ (and they were considered to be few) were described only in the text-books on surgery, and all operations were made by general surgeons.

About this time the operation of strabotomy was first made in this country. Dieffenbach and others in Europe were becoming famous by this operation. American surgeons were not slow in coming to the front for the relief of this deformity, if it may be thus characterised. Now and then

some peripatetic individual would be heard of as going up and down the country making the operation. If he cut too much or too little, or otherwise improperly, it was all the same to him—he had whatever fee he could obtain, and had gone on his way rejoicing, as did pretended ovariotomists, for a time, one of the latter killing four women in my county.

As to the literature and treatment of fractures, the same will apply as when speaking of the surgery of the eye. All there was on the subject in American medical literature was only found in the text-book of Gibson. I now refer to purely American authorities. There have been no great changes so far as the position of the limbs under treatment is concerned. The greatest has been in treating fractures of the femur.

Fifty years ago the surgeons of this country did not treat fractures of this bone in a straight position, but usually upon the double inclined plane. Buck's apparatus (as it is called) did not come into general use until about thirty years ago, although the use of adhesive straps for extension was claimed by others many years before. The various materials for short splints, now in use (except wood), were unknown as such fifty years ago. In this country, Little of this city about twenty years ago brought into prominence, or gave an American impetus to, the plaster of Paris splints and bandages, which were first suggested by Mathieson and Van der Vos of Holland. Of Colles fracture, opinions, then as now, were at variance as to its true pathology, yet it was well known that the results of its treatment, immediate and sometimes remote, were often very unsatisfactory; yet the ordinary dressing for fracture of both radius and ulna was the one in use, occasionally at the present time, as well as the Bond or "pistol shaped." It is believed by many, more especially the surgeons of western New York, that it was reserved for Professor Moore, of Rochester, under very favourable circumstances, to ascertain, by dissection of a trauma in each wrist, the true pathology of this fracture, and to incorporate it into the medical literature of this country.

I will not consume time in speaking of the changes in treatment in minor surgical injuries, as they are not of sufficient consequence. Perhaps in the treatment of no fracture has there been more ingenuity expended, than in the efforts to cosmetically repair those of the clavicle.

From the innumerable number of yards of which the cotton rollers of Desault were composed, and which was the dressing fifty years ago—the ring of Fox, the sap yoke of Day, the mole skin adhesive strap of Sayre, the sling of Hamilton, the cravat of Moore, and the dorsal decubitus, without mentioning others, the results, as a rule (with the exception of the latter), are the same—imperfect so far as appearances are concerned, yet perfect so far as usefulness is desired.

Fifty years ago, if I remember correctly, there was but one standard American work on midwifery, and that was by Dewees, another Philadelphia professor in the university of that city.

At that time it was the custom in this country to place the parturient in a semi-recumbent, or rather in a sitting position, which was thought best obtained by placing her upon the edge of the bed with back supported in various ways.

At least the semi-prone was not allowable, yet under certain circumstances the patient was allowed the dorsal, and at other times the knee position.

With the exception of occasionally allowing the patient to get upon her feet, other positions and movements were believed to retard the labour. No "do as you please" course was allowed. The writer believes that he was the pioneer accoucheur in his county, who began a crusade against this abominable position and the attendant restrictions, and yet he did not begin the warfare before a woman, while in labour, and in a frightful convulsion, pitched herself forwards into his lap and from there to the floor.

Then and there he determined upon what was considered an objectionable innovation, and it required quite a long time to bring it about, more especially with those who had been accustomed to occupy this barbarous position.

After the termination of the labour, no antiseptic injections were necessary—no nomadic tribes of microörganisms had yet folded their tents and stolen away—forceps were seldom used, and cervical fissures and lacerated perinaeums seldom occurred.

There was no work for the gynaecologist, even if he had been in existence.

Very few physicians had a pair of forceps. In fact, I remember quite a distinguished professor of obstetrics who advised his graduating class, when speaking of the forceps, not to purchase a pair until they had been in practice some years, lest, from error in judgment, they might be induced unnecessarily, and perhaps unskilfully, to apply them, but to call to their aid one of large experience for the purpose of obtaining advice.

At this period it was also the custom, and we were so taught, not to apply the child to the breasts until they were fully distended—a period of forty-eight to sixty hours after parturition. Hence cases of mastitis and mammary abscesses were frequent.

The writer has now under his care a case of carcinoma of the right mammary gland, occurring in a woman whom he delivered thirty-six years ago, the same breast having been riddled with abscesses at that time. I believe at this period demonstrative midwifery had not been ventured upon in America.

No special advances in the surgical practice of obstetrics have been made. There is less hesitation in making the Caesarian section than before antisepsis. While I do not consider it an advance, everything being considered, because every tyro in the profession will scarcely allow a child to be delivered, if he happens to have his forceps with him, without applying them, yet they are more used, and very properly sometimes, than they were fifty years ago. Cervical fissures and lacerated perinaeums were far less frequent at that time than at the present day, and pray tell me the reason, you who know, but don't say they were there to the same extent,

yet were not sought, for to say the latter would be to charge the able men of that day with being ignoramuses.

With that objectionable advance it is no wonder that a special branch in surgery seemed to become necessary to suture many fissures and lacerated perinaeums that fifty years ago would not have occurred. The writer practised midwifery many years, and not to a very limited extent, before he saw a case, in his own practice, of a lacerated perinaeum, and that cutaneous, which united without a suture within a month.

However, not long since he was regaled with something like the following, the narrator being desirous to impress upon him the gravity of the case, which had recently been under his care: "I put on the forceps and braced myself as securely as possible, and pulled with all the strength I had, and failing, I called for assistance, when both succeeded." Now, although he was not a powerful man, yet I was so appalled that I could only say, "Doctor, did you leave the woman intact, and her uterus within her?" His reply was, "Oh! of course there was an extensive laceration, vaginal as well as perinaeal, extending into the rectum." What an obstetric triumph!

Is it any wonder that fissures and lacerations are abundant? The violation of all known surgical rules in midwifery, in using traction with the forceps where they are indicated, seems to be the rule with many, and not the exception, at the present day.

Where once there was but one American forceps, now "their names are legion." Most men who have been honoured with the appellation, professor of obstetrics, have had their forceps named after them, even when the most careful observer has been unable to discover much beside a distinction without a difference. Although the pendulum is beginning to swing the other way, so far as the repair of cervical fissures is concerned, yet the field of the gynaecologist seems yet to be unlimited.

Fifty years ago a recognised albuminuria and its effects in

the pregnant woman were unknown. 'T is true that occasionally a pregnant woman became anasarcous, with headache, vertigo, and more or less amaurotic, but it was considered as nothing of consequence, and she was subjected to no treatment; in fact, such a condition seldom came under the observation of him who was to attend her in her labour.

The writer has attended many such cases, knowing nothing of this condition until the parturient's pain had begun, the women passing through their labours without an objectionable symptom, no one knowing whether the amount of renal elimination in twenty-four hours was one gill or one quart, nor whether there was five per cent. of albumen or none.

How fortunate for his peace of mind was it, judging from the present fears when albumen is so abundant, that he did not know that he was sitting bestride a crater, through which he was liable, at any moment, to be overwhelmed by an ejectment of the lava of eclampsia.

Golding Bird and Bright, of England, had been subjecting the urine to analysis, but not in relation to pregnancy. I have delivered many women whose anasarca, at the present time, would almost compel the expectant accoucher to resort to chloral or other hypnotics if he expected to escape insomnia, so great would be his fear; and yet no thought of nephritis had ever yet entered the mind of man as a complication in pregnancy.

Bright found albumen and the same objective symptoms in the various grades of nephritis, but did not seem to comprehend its application to the pregnant woman. Now and then, if the woman was plethoric and the cephalalgia and faulty vision were too annoying, a free venesection and saline cathartic would enable her to go safely through her gestation and labour.

I cannot resist the belief that some subtle protective agencies surrounded the pregnant woman of fifty years ago, if the conditions above spoken of were so serious as they are believed to be at the present time, as, notwithstanding the alertness of the accoucher at this time, I believe the mortality of lying-in women at that remote period was no greater than now.

Fifty years ago, sepsis, as a *sequela* of parturition, was unthought of, but the malady was christened by the name "childbed fever." Later on as "puerperal fever," its cause was believed to be, as in mastitis, owing to atmospheric influences. By many it was believed to be erysipelatous in character. The justly distinguished Dr. Gordon, of Aberdeen, Scotland, wrote extensively on the subject, and believed it to be inflammatory in character. Others took issue with him, and thought that, to a certain degree, it was contagious. The former bled largely, and his statistics presented a complete justification of his practice. Who can say that the puerperal fever of Gordon and others, was the same, so far as its pathology is concerned, as that of the puerperal septicaemia of to-day? If their pathology is the same, how account for the propriety of so diametrically opposed treatments? Many present will remember the warm discussion of this subject between the classic Meigs and the poet-doctor, Holmes, some years ago, the former believing in its non-contagious character. It is only a few years since that antiseptic uterine and vaginal injections were deemed of importance during and after normal labour, and I am unable to ascertain whether the mortality has been diminished by such extravagant and lavish use of them. A case of *suspected* sepsis which recovers after so much flushing of the parts, does not prove that it is a genuine case of toxemia, as I believe it is rare for an undoubted case to recover after the septic material has found its way into the circulation, be the injections never so freely used. As well might we undertake to pump poisonous material from the circulation by lavage of the stomach. However, it is not the province of this paper to discuss the treatment of any disease and I will hasten on.

Fifty years ago chloroform had never been used to mitigate the pains of parturition, although it and sulphuric ether had, for a little time, been experimented with in the extraction of teeth, yet it was left for Simpson of Edinburgh to first administer it to the parturient female. Since then it has had its advocates in innumerable cases of labour.

In the practice of medicine fifty years ago, the young graduate, compared with the present day, so far as therapeutic agents were concerned, had but little to learn, and but little to do with after he had learned.

The inflammatory diseases were sthenic in character.

Typhoid fever in western New York was unknown, or at least not recognised, yet intermittent fever abounded. At long intervals a case of typhus fever came under observation, and as the pathology of typhoid fever was yet untaught in this country, it is quite possible they were confounded. A remittent type was quite common during the autumnal months.

Physical exploration was just beginning to engage the attention of the profession in America. On pathology there was no American work. That by Carswell of Ireland was the one for reference.

So, too, was it in diseases of the nervous system. There was no American work on diseases of that portion of the organism. Brown-Sequard had scarcely begun his brilliant career, and some in this country, who have since become famous in their investigations of the morbid conditions of this portion of the economy, were unknown, while others had not even joined the professional ranks.

Neuralgia, as a distinct disease, was not recognised in this country half a century ago.

The pleurisies and pneumonias of that day were highly inflammatory in character. Even then the antipyretics were but few, consisting of tartarised antimony, James' and Dover's powder, which were usually preceded by venesection, the result of which was eminently satisfactory, strange as it may seem to those who are now asked to medicate the adynamic maladies of the present time.

It does not become those who jeer at the use of the lancet in that day, when the only reason for so doing is the ignorance of the type of the diseases which then prevailed.

Because the physician of to-day does not, upon entering the sick room of a victim of pneumonia, behold one whose respira-

tions are laborious and exclusively abdominal, whose skin is cyanotic, pulse about one hundred—full, hard, and almost incompressible, with severe lancinating pains in the chest, accompanied with more or less copious expectoration of bloody mucus, sometimes amounting to pure haemorrhage without mucus, he must not say that that was not the type of forty and fifty years ago, and that the loss of twenty or thirty ounces of blood, and sometimes repeated, did not entirely change the patient's condition for the better.

"Heart failure," in the present acceptation of the phrase, as applied to a fatal case of pneumonia, was unknown fifty years ago, as the cardiac action was strong during the progress of the malady, and the blood much more highly oxygenised than at the present day.

The approach of the various stages of the disease was readily detected, whereas now, almost without warning, consolidation is found. The heart fails to receive its proper nutrition, the pulse soon is racing away at a rate of one hundred and thirty or forty beats per minute, with asphyxia and "heart failure" indeed, as a result. Cathartics rather than laxatives were more freely used than now.

Mercury in larger doses than now was believed to be very essential, as hepatic diseases were more common than at the present time, as now they are more functional than organic.

Counter irritation was a very important therapeutic agent at that time, and in the writer's opinion is sadly neglected now.

Membranous croup in the writer's locality was not common. Diphtheritic croup, or rather laryngeal diphtheria, was unknown in this country for many years after the period above referred to, and I believe it had not yet left its European strongholds. Aboutforty years ago, after Bretoneau, Trousseau, and others of France had written much upon it, it sought other fields to conquer and marched upon America, and being pleased with its new territory has protracted its stay, seeming to have been crowned with innumerable victories.

All the infantile diseases, as at the present, were met with, and no essential change in their therapeutic management, except in greater variety, has been made. The writer remembers but one small work on the diseases of children, and that by Eberle, an author before spoken of, fifty years ago.

In scarlet-fever, as it then prevailed, the cause of the anasarca was unknown, and the profession groped along, not suspecting a nephritis, until the classic monograph of Morris was written some years after. Then the profession became aroused, and began to direct their attention to the renal elimination, *not by an analysis* of the urine, but by the colour and quantity more especially. It was then known that the greater the paucity and smoky appearance there was, the greater the danger of eclampsia; albumen was not suspected.

The profession were then very properly advised to be on the alert for these indications of danger throughout the course of the malady, and were thus enabled to ward off the intercurrent danger in the great majority of the cases, so far as the kidney complication was concerned.

In the treatment of what some term idiopathic peritonitis there has been no essential change. Cathartics were given, but not early. Opium, in substance, was much preferred to morphia, as it is by some at the present time. The quantity, however, was far less than it should have been. The profession seemed to have been governed by the quantity given, fearing opium narcosis, rather than by their failure in answering fully the indications.

It seemed to require that profound clinician, Prof. Alonzo Clark, to mitigate their fears, and they became more bold, yet even now much timidity is observed. The writer fears that some gynaecologists, in their recommendations relative to the use of cathartics, have confused, unintentionally, however, many of the younger general practitioners in medicine.

In the treatment of pleurisy fifty years ago, calomel was generally used, for the reason that it was believed

to retard, if not prevent, effusion and adhesions. It was preceded by venesection. That belief is not entirely ignored at the present day. The same indications are now sought to be answered by new agents.

However there has been a very great improvement in practice after effusion has occurred. Fifty years ago, if practised at all, paracentesis of the chest cavities was postponed until the eleventh hour, as alteratives, diuretics, and counter irritation were the daily "bill of fare" for removing the fluid. For let it be remembered that at that period the serous discharge from a blister, and the salivation induced by a liberal use of mercury, were believed to be the direct drainage from the diseased cavities, and nôt simply the constitutional and local effects of the agents. As before said, if paracentesis was performed, it was done at the eleventh hour, with fear and trembling, and as a *dernier ressort.*

Perhaps in no disease, whatever the result may be, has there been a greater revolution in its treatment, both medical and hygienic, than in phthisis, or tuberculosis, wherever located. Fifty years ago to treat a case of consumption, as it was then called, either medicinally or otherwise (and there was no otherwise in those days), as other than a purely inflammatory malady, would have been considered the height of ignorance. Tartarised antimony internally and as a counter irritant, aromatic sulphuric acid, opium in moderation, with issue-peas in the arm, together with a restricted diet—and restricted diet meant non-nutritious—was the orthodox treatment, and for ten or twelve years thereafter.

At the period upon which the object of this paper is based, the dietary in fevers approached the starvation variety. There seemed to be an intuitive idea, judging from the treatment recommended, that fevers were closely allied to inflammatory action; hence the diet must be non-nutritious and non-stimulating.

True, the pulse was usually strong, and ranging about a hundred, except in typhus, the latter form, however, was rarely seen in the country districts. The temperature was

unknown, as at that time medical thermometry had not been revived, consequently a fever thermometer was unknown to the profession. Tonics were strictly forbidden before convalescence.

More than twenty years elapsed before a fever thermometer was in general use, and the only guide the physician had that the fever had passed off (and of that in some cases he was not positive), was usually by a slight and sometimes exhausting diarrhoea accompanied by more or less perspiration with a moist and clearing tongue.

Quinine was introduced with almost fear and trembling lest the fever would be revived, and when it was, it was often too late to be of service.

The critical days—seven, nine, fourteen, and twenty-one—were fully believed in, and yet the treatment pursued in no wise protected the patient against the exhausting condition in which he would be found when they occurred.

While the writer does not believe that quinine was so early indicated in the grade of fevers which prevailed in the rural districts fifty years ago as at the present, yet that it should have been given much earlier than it was, he now well knows. The "country doctor" at that period believed that cinchona bark was a stimulating tonic, and based his fear of quinine upon the fact that it was its alkaloid, and consequently that its therapeutic effect was the same.

Fifty years ago but little was known of what is termed Bright's disease. Although much had been written upon it by Bright, yet its true pathology, and the varying grades of the kidney lesion, were generally unknown. I believe no analysis of the urine was deemed necessary. The patient was said to have dropsy, but no one knew why, and if he had a granular degeneration the practitioner did not know it.

It was a number of years thereafter, before the profession in this country were told anything about the elimination of albumen as indicating a structural disease of the kidney, but when the cardiac complication supervened, then the heart was charged with being the primary cause of the constitu-

tional symptoms. Therefore, nothing need be said of its treatment.

Fifty years ago but little was known of the pathology of the various structural lesions of the heart, in this country. At that time, if my memory is correct, no monograph on diseases of that organ had been written by anyone in this country, unless the one by Alonzo Clark had, but of that I am not certain. The text-books, herebefore mentioned, said something on the subject, yet the medical practitioner was made but little more intelligent on the subject, as physical exploration was yet in its infancy in America. A few years after, the lamented Flint, a young physician in Buffalo, wrote a valuable work on the "Pathology of Diseases of the Heart," and soon became famous, as you well know, for his researches in physical exploration.

With all our present knowledge of the pathology of its diseases, lamentable as is the fact, except in that achievement, how much has been gained? The profession are more intelligent, it is true, but has that intelligence benefited us or the patient, except to supply a greater variety of palliatives? For the use of the various cardiac agents of the present day, we must thank the indefatigable labourers in Materia Medica's vineyard.

In the departments of medicine, that of materia medica has kept well to the front and far ahead of some, as new discoveries do not altogether depend upon the medical profession, except so far as to apply the agents in answering the indications which the physician discovers in the specific disease which he is called to treat. I cannot hope to more than glance at this department of medicine, as I have already wearied you, and my paper is already "long drawn out," but when I think that fifty years ago the only prominent medical agent in all diseases of the heart (and they were known to be but few), was digitalis, and that prescribed *as a depressant* (for all diseases of that organ were believed to be inflammatory, and intended to be treated as such, and for the same therapeutic influence was it given), I am appalled. The

same agent was also given as an *arterial sedative* in pneumonia and pleurisy, after venesection, etc.

Really physicians of that day "builded better than they knew," for had one been known to prescribe it as cardiac tonic, he would not only have subjected himself to an avalanche of ridicule, but a jury of medical men would have brought in a verdict of guilty of malapraxis or insanity.

There is still a large number of therapeutic agents in use now which occupied the front rank fifty years ago. Has a satisfactory substitute for opium and its alkaloids yet been found? Has the combination of opium and acetate of lead, or opium and camphor, yet been superseded? These, conjoined with modifications, were in daily use at the period spoken of.

Many practitioners at that period when desirious of giving opium or its alkaloid—morphia, (codein not being in use)—were more particular in their selection, as they believed that opium was better adapted to some maladies than the salts of morphia. In inflammations of the serous membranes its curative influence was believed to be much more decided. Hence, in pleuritis and peritonitis, it was almost exclusively used in preference to morphia. The writer's experience has remained unchanged except when hypodermatically indicated.

In diseases of the mucous lining of the lower portion of the alimentary canal, a favorite practice was to introduce the opium in the form of a *hard* pill, believing that its influence would be thereby delayed in its assimilation, until it had reached the diseased part. Whether that be true or not, yet the belief has not been entirely abandoned by many of the older practitioners of the present time.

Fifty years ago when an appetising agent was indicated during the convalescence from an acute disease, cinchona was always preferred to quinine, and when the disease had been an intermittent fever, Fowler's solution of arsenic was frequently combined to guard against a recurrence. In that day the crude bark was the usual form, although I believe Huxham's tincture could be had. Now the various eligible pre-

parations of cinchona afford no excuse for the stereotyped prescriptions of the less appetising agent—quinine—unless some other indication is to be answered.

But, as the writer said in a paper which he had the pleasure of reading before this association in earlier days (aye even and nights), when it was in its nurse's arms: "In the practice of medicine fashions change as they do in wearing apparel," and thus it will be until time shall be no more.

Finally as I cannot hope to complete the subject at which I aimed when I began this desultory paper, I will close by saying:—In all other departments of medicine, I cannot believe that there will have been so great changes when the next semi-centennial shall have dawned upon the medical world as have been witnessed during the last, save in those of materia medica and brain surgery, as in the former the researches are destined to eclipse the past and astound those practitioners who may be living at that time, and who were personally cognisant of the status of medicine at the present day.

As to brain surgery, I unhesitatingly make the prediction that the time is not far distant when, in selected cases, the operation of trepanning will frequently be made for the purpose of removing the clot of cerebral haemorrhage, or after an apoplectic cyst is formed, as well as for searching for collections of pus and the removal of intra-cranial tumors.

DISCUSSION.

Dr. CRONYN, of Erie county, said he believed there was no one present old enough to discuss the paper. He could indorse every word that had been said in the paper, and he could do this because he had had the opportunity of seeing and pursuing with careful observation the various changes which Dr. Colvin had described. Regarding the use of forceps and consequent lacerations of the perinæum, he would say that the older practitioners were not very familiar with the forceps, and their forgetfulness of the axis of the outlet accounted for the numerous lacerations. The author had hinted that there were fewer cases of puerperal fever fifty years ago than we had to-day, and he entirely agreed with him. He thought he could number his obstetrical cases by something over three thousand, and he had never had over three cases of puerperal sepsis. He used the forceps seldom. His son, who was a medical practitioner, used the for-

ceps now about fifty times to his father's once. Whether or not he had more lacerations of the perinaeum and of the cervix he could not say, for about this his son would never speak.

The speaker said that on more than one occasion he had stated that materia medica had occupied a large share of his attention. As to combinations of drugs he would say once more that by combining opium and quinine a much larger dose of opium may be administered with perfect safety, and without the production of either cinchonism or narcotism. It was well known that by combining belladonna with atropia, larger doses could be given of both so combined without producing poisonous results, and with better therapeutic effect. He was positive that in certain serous inflammations opium was as useful to-day as it was fifty years ago, and he was disposed to think that serious results from inflammatory action fifty years ago were less common. The desire to remove pain readily by hypodermic injection was responsible for the comparative rarity with which opium was used. The pain was removed but the cause was not—the disease was still going on. This was very much like the use of anaesthetics by some surgeons to prevent shock. The shock went on just the same, as he stated yesterday, when he referred to the fact that when the peritonaeum was cut the person who was carefully observing the patient would find distinct evidences of shock. This was not usually observed by operators whose attention was engaged with other matters.

The PRESIDENT said he wished to thank the author for his paper. He could come very near to limiting his experiences by fifty years. The author's experience had been nearly parallel with that of Dr. Cronyn and himself. Their circumstances had been very much the same. It had seemed to him like a renewal of his own life, and he felt that he could not have written so well his own experiences as had been done by the author. The shades of thought, the change of practice, and the influences exerted in the profession and over the profession had been certainly well portrayed. Reference had been made in the paper to Dr. Flint, Sr., formerly of Buffalo. His first teachings in regard to affections of the heart had been received from Dr. Flint in his own office. Regarding the use of opium and similar matters, he wondered how this same Austin Flint's teaching overshadowed the present day—he was so far in advance of the best medical men of that time. He and Dr. Alonzo Clark were ready to control peritonitis at that time by large doses of opium. He could vividly recall an epidemic of peritonitis, beginning in a puerperal patient and extending to other members of the family. One of these cases was a delicate boy to whom he had given eighteen grains of morphia by weight in thirty-six consecutive hours, and yet at any time during this period he could look the physician in the face and speak of his pain. His pupils had contracted finally to a pin-point, and he soon became drowsy and surrendered to the drug; and from that moment improvement began. He was now a strong, vigourous banker of over fifty years.

A PRACTICAL STUDY OF SERIOUS ABDOMINAL CONTUSIONS, WITH A CLINICAL REPORT OF TWENTY-ONE CASES.

By Thomas H. Manley, M. D., of New York County.

October 11, 1894.

During the past year (1894), a singularly large number of abdominal injuries of the non-penetrating variety have come under my care.

Taken as a group, they presented so many varied and unusual features, it occurred to me that a short record of them, with a few others included, would supply a text for a brief study of that interesting and highly important subject, "Abdominal Contusions."

It was my intention at first, to embrace within the scope of this review, as a preliminary portion, a series of experiments on the lower animals, to be *en rapport* with the tendency of the times, and endeavour to support the clinical side by observations derived from pathological conditions deliberately produced.

This no doubt would lend additional interest and value to the subject, but on reflection I was finally convinced that the additional light imparted by this sort of inductional observation would not compensate for the trouble and the necessary amount of suffering imposed, for without very great force it would be impossible to rupture any part of the digestive tract of the dog, or seriously lacerate the solid fixed organs or the large blood-trunks.

And though this were practicable under anaesthesia, as soon as reaction would set in acute peritonitis with agonising distress must inevitably have followed. Furthermore, as everyone knows who has had any experience in experimental

abdominal surgery on the dog, his tissues are of a vastly tougher and stronger consistence, and their reparative energy far greater than in man, it is easy to understand that inferences derived from this line of investigation can at best possess but a relative value when applied to analogous vital structures of the human being. For these reasons it was decided to proceed on data derived solely from *human experimentation*—from that knowledge gathered from numerous cases coming under my own care, which could be observed throughout, from the time of injury until recovery or death; and in the latter event followed to the autopsy-room, when the injured structures or viscera could be separately examined under the naked eye.

With a view of enhancing the value of these observations and giving them additional practical interest, the columns of several of the most noted authorities in surgery have been examined, and from them are copied their views and opinions, as well as cases that have a pertinency to the subject here considered.

As the study of abdominal contusions is a large one, to deal with which by a systematic plan in full detail would carry one to a considerable length, in the present instance an effort will be made to condense and reduce it within such limits as will not cover too much ground, and yet permit a fairly full exposition of it.

ANATOMICAL OUTLINE.

The anterior abdominal parietes present a convex, trapezoid, elliptical contour, with an inward slope along their superior and inferior vertical and lateral planes.

If we draw a line from the insertion of the ensiform cartilage above to the symphysis pubis below, we will observe that as the free borders of the alae thoracis spread outward above, a conical outline is presented in the centre, the base of which broadens as we descend to the navel, and from below upward the obliquity of the pelvis, with the inward inclination of Poupart's ligaments, contributes toward an inferior

conical terminus, though not so sharply defined as the one above.

Now, if we intersect this vertical line through the centre of the abdominal areas by one horizontal, passing through the umbilicus and carried as far back on either side as the inner margin of the erector spinae muscle, and midway between the last floating rib and the crest of the ilium, we will observe that the lateral terminus on either side takes the form of a cone through the direction in which the outline of the ribs incline and the iliac border broadens as it descends. The transverse or horizontal diameter is slightly greater than the vertical, varying according to the peculiarity of build in certain individuals. Of the three great cavities, the abdominal is least invested by a bony structure. The quadratus lumborum, the psoas muscles, fascia, erector spinae, and lumbar vertebrae contribute a formidable protection from behind, so that concentrated traumatic force cannot often be transmitted forward to the viscera within the peritonaeum, without serious damage of the lumbar vertebrae, or the corda equina, being first sustained. The abdomen is practically a large sac, which contains all the essential organs of digestion and excretion, if we exclude the lungs and integument. This vast pouch is mainly protected and supported anteriorly and laterally by voluntary muscular tissue. The muscles pass in transverse and vertical directions, and collectively constitute the "abdominal girth."

The digestive tube, which receives its solids, liquids, and gases through the mouth, and is drained by way of the rectum, chiefly occupies the abdominal cavity, and is most exposed to injuries.

The solid viscera here are best protected. Normally the greater volume of the liver rests under the shelving dome of the diaphragm, behind the ribs on the right side. The spleen rises high under the ribs on the left side, and is well protected in health, but the free edge of the liver projects downward on inspiration on right or left side, and the spleen only when enlarged. The pancreas is a suspended organ

behind the duodenum, resting on the aorta quite out of harm's way, except when such force is applied as first disorganises the overlying parts.

In the standing attitude each kidney is a freely moving body, rising and falling an inch or more, with each respiratory act. They lie behind the peritonaeum, imbedded in loose fat, on the psoas muscles, close to the bodies of the lumbar vertebrae, and in spite of their protected position, are most exposed to trauma of all the solid viscera in the abdominal cavity. Large blood-trunks occupy the posterior abdominal walls, passing on to the lower extremities, and from the alimentary canal to the liver. The ureters pass down behind the peritonaeum to the bladder; and the thoracic duct, which commences on the body of the second lumbar vertebra, ascends upward through the aortic opening of the diaphragm. The common bile duct courses obliquely downward and inward, along the side of the spinal column to enter the duodenum. If we view the lumbar wall as the lower base of support of the inferior abdominal viscera, which it really is in the recumbent position, it is interesting and important to note, that it consists of two broad lateral hollows, separated by a prominent ridge of osseous structures, the bodies of the lumbar vertebrae.

The subdiaphragmatic contents of the abdomen are most effectually protected by the arched domes of the thoracic wings.

It is important to remember, that the apex of the diaphragm on the left side, rises as high as the sixth intercostal space, or about one inch below the nipple-line, and on the right side to a point about one inch lower, and that posteriorly its summit is nearly on a level with the ninth intercostal space. It is therefore apparent that the stomach in the empty state, the liver, spleen, and gall-bladder are so sheltered by the lower segment of the thorax, that when they are exposed to direct violence, the primary impact first encounters the ensiform and the costal cartilages, the ribs, pleura, and lung.

By this provision in the architecture of the body, while the pulmonary organs are most exposed, those solid viscera lying

under the diaphragm are spared. Hence we will often see costal fracture below the sixth intercostal space, with or without pleural or pulmonary complications, when the abdominal contents entirely escape.

The general muscular support of the abdomen is quite equally distributed, and protection is only defective at those points through which the umbilical vessels passed in foetal life, and over the inguinal and crural planes rendered defective through the evolution of anatomical development.

The muscles investing the antero-lateral walls of the abdomen are strengthened, enveloped, and anchored by powerful fibrous sheaths and a broad, strong, tendinous aponeurosis. The muscles are so arranged that they pass downward from the thorax in the centre and obliquely laterally.

In the male the abdominal cavity is wholly enveloped by muscles, except in the median line above the umbilicus, where the fibres of the recti diverge. Below the navel in females who have borne many children, the internal borders of the recti at the linea alba, are so widely separated that support is only maintained by the central aponeurosis. The principal central support of the abdomen is derived from the recti muscles. Each of these muscles is separated from the other by a dense fibrous septum and is enveloped by an investment of the abdominal fascia, which splits in two layers as it approaches its outer border, and then coalesces as it approaches the linea alba.

Thus the sheath of the abdominal rectus is more powerful and resistant for the volume of the muscle than any other in the body. The action of the rectus abdominalis, when the body is fixed, is to actively compress the abdominal viscera (*a*) backward, (*b*) upward, (*c*) downward, and (*d*) partly laterally.

When the muscles of the lateral walls act conjointly in contraction, the extent of intra-abdominal displacement is very great, in fact practically pushing the movable viscera up under the diphragm, downward into the pelvis, and backward along the lateral hollows of the spine.

We sometimes see individuals with such command over

their abdominal muscles that they can flatten and depress the ventral convexity at will. If we observe the motions of the thorax while this ventral feat is being performed, it will always be noticed that abdominal collapse is simultaneous with the forced and prolonged expiratory act, the lungs rising high under the clavicles while the viscera follow upward the retreating diaphragm.

The oblique and transverse muscles, besides supporting and protecting the abdominal contents when the body is fixed, are capable of maintaining remarkable pressure on them. They are invested externally by a dense fascia, which above is continuous with the thoracic, below blends with Poupart's ligament, laterally with the lumber fascia, and joined to form the linea alba.

The coalescence of the external fascia abdominalis with the upper margin of Poupart's ligament produces that crease in fat people which runs across the lower side of the abdomen. It has recently been claimed by a distinguished writer on anatomy, that this depressed line does not correspond with Poupart's ligament, and is an unsafe guide in operations; that the ligament may be much lower than it, and the only safe guide to the ligament is by a line drawn from the anterior superior spine of the ilium to the pubic symphisis.[1] But this is clearly an error, and capable of misleading one not accustomed to manipulations on the living subject. Poupart's ligament rarely deviates from its course, and in all cases the under layer of the integument is more or less adherent to it.

The femoral arcade marks the inferior boundary of the three lateral muscles of the abdominal wall, and passing through their tendinous insertions, is the inguinal canal, a portal which, when normally formed, instead of being opened, by augmentation of abdominal pressure, is all the more firmly closed. The psoas muscles on the inside, the quadratus lumborum and erector spinae inclosed in laminae of the lumbar fascia covering the loin, form the posterior muscular boundary of the abdomen.

[1]Keen in American edition of "Gray's Anatomy."

The abdominal wall is everywhere lined by a strong fibro-cellular membrane, designated variously, according to the situation it occupies. Thus we have the fascia transversalis continuous with the pelvic fascia, the iliac, and inner lamella of the lumber fascia.

THE ABDOMINAL CAVITY.

This cavity possesses several distinctive characteristics:

1. It is the least protected by an osseous envelope.
2. Its serous membrane is of vast dimensions.
3. It contains important viscera outside of its serous investment.
4. It is ever varying in capacity.

Though apparently the most exposed to violence, by a moderate inclination of the trunk on the hips and a firm contraction of its overlying muscles, force is received and diverted on other less vulnerable parts; thus its contents may escape serious damage.

Exclusive of the renal organs, all of the abdominal viscera are more or less completely invested by the peritonaeum.

The greater part of the cavity of the peritonaeum is occupied by a hollow tubular structure, the alimentary tube, the greater part of which is tethered to the spine by the mesentery. This convoluted tube is constantly distended by gases, elaborated in the chemical processes of digestion. The gaseous distention of the intestine floats it in the peritonaeal sac. With the pneumatic organs above, it aids in giving buoyancy to the whole body. In the event of contusion or sudden abdominal compression, these gaseous coils, by their mobility and resistance, serve to diminish and minimise its effects.

In the normal state, all the abdominal organs are in incessant motion. This is attributable chiefly to two influences: first, to respiration; second, the small intestine, from the pylorus to the ileo-caecal portal, by a continuous vermicular motion, called peristalsis, is in ever-ceaseless action, varying according to changing physiological conditions. The

circulation of the blood must constitute another factor to intra-peritonaeal motion, by the powerful impulse transmitted by the aortic torrent, the steady upward current through the cava, the confluent tide through the large portal tributaries, and lastly, the pulsation of those large arterial trunks, leading to the great centres of digestion. The coils of the jejunum and ilium lie in close contact with the anterior and lateral abdominal walls, being separated only by the omentum and probably a very thin medium of lymph. The stomach when distended with food, descends down as far as the umbilicus, lying rather to the left of the median line in nearly a vertical position.

The large intestine in its ascending and descending segment, lies so far back as to be well protected. The caput coli in the right iliac fossa and the sigmoid flexure in the left are more exposed. The bladder, when empty, is safely sheltered by the pubes, but when distended it rises into the abdomen, its anterior surface pressing against the parietal peritonaeum, while its fundus is inclined toward the sacrum. The pregnant uterus extends up into the abdominal cavity after the fourth month.

It is apparent from the foregoing that the arrangement of the abdominal viscera is ever undergoing changes, under various physiological conditions and various circumstances in health, and it is well to remember that all these organs, under the influences of life, are like so many independent beings in motion, their relation then and after death, bearing but little analogy. Nor should it be forgotten that assymetry of development in the organs, variability in origin and direction, with altered relations of structure, are exceedingly common in the abdomen.

The serous membrane, investing the abdominal cavity and its contained organs, is variously described by different anatomists, although their descriptions are usually so complex and intricate, that nobody can clearly comprehend them. To describe it briefly and accurately in a few words, it may be said that it is quite identical to the synovial membrane of an

articulation; that the peritonaeal cavity is simply a joint in which move and play on each other the organs of digestion. This joint is first invested with a parietal layer, and next all the contained organs are covered more or less by the same structure; except where they are attached at their outlets.

It is a lymph sac and its secreted fluid serves the purpose of a lubricant. Its structural study has been vastly complicated by that apron of tissue, known as the omentum, the real purpose of which is yet unknown, but in this connection, what most concerns us is an acquaintance with the functions of the peritonaeum.

In the average text-book on physiology, but little information is imparted on the vital properties of the peritonaeum. It is important, however, that we become acquainted with some of them before its traumatisms are considered. In examining the contents of the abdomen we will notice that the solar plexus, the centre of the great sympathetic system which provides the nerve supply for all the abdominal viscera, is lodged in duplications of this serous membrane, and that it is placed behind the stomach in front of the aorta and crura of the diaphragm. This vast plexus, we will find, receives the splanchnic nerves and branches from the pneumogastric. As its branches spread over the viscera a separate plexus in various directions is formed and designated according to locality. This system presides over vegetative life, and is concerned almost exclusively in the processes of digestion and nutrition in metabolic and regenerative changes. This we can often demonstrate in inguinal colotomy, and in other instances, when on division of it with the scalpel no pain is felt. But its basement membrane of fibro-cellular tissue with the advent of inflammation becomes exquisitely sensitive. The peritonaeal cavity has only an imaginary existence, for all the surfaces of the viscera within it lie in close contact; contraction and relaxation of the abdominal muscles regulating the extent of intestinal distention in health, and confining the viscera in close apposition. As has been stated, normally all the organs invested by the peritonaeum are in constant motion, but with the advent of

inflammatory changes, as these extend into the muscular and glandular coats of the intestine, peristalsis diminishes or ceases, and the secretory action of the glands or follicles is for the time reduced or wholly arrested. The bladder wall, as inflammatory processes are propagated into its tunics or the overlying expulsive muscles of the abdomen, is unable to contract and expel the urine. The peritonaeum possesses marvelous plastic properties, so that on the slightest irritation being applied to any part of its surface, it soon becomes adherent to the nearest organ.

Another salutary property of this great lymph sac, is its remarkable facility to absorb fluids.

Moderate quantities of healthy urine, bile, chyle, pancreatic, gastric, or intestinal juice, or blood, are promptly resorbed by it without dangerous inflammation supervening. Enormous effusions of blood into the cavity of the peritonaeum are quickly disintegrated and resorbed. It is equally competent to dissipate and take up the serous elements of local inflammatory action, and my experience has convinced me that it is equally potent in walling off, reducing, destroying, and resorbing small foci of suppuration.

The abdominal viscera being abundantly provided with a vascular supply in the event of sudden commotion, are frequently the seat of haemorrhagic effusions. These may occur into the parenchyma of a solid organ, through the vessels of the mucosum into the lumen of the intestine, through the capsule of an organ, extra or intra peritonaeally. The kidney, of all the organs of the abdomen, is most frequently the seat of traumatic haemorrhage. The blood may escape through its capsule into the loose retro-peritonaeal tissues, or into the hilum and then through the ureter. In occasional instances those types of haemorrhage may cöexist. They are most frequently encountered in association with spinal injuries, though they exist independently of cord implication.

DYNAMICS OF THE ABDOMEN.

The abdomen provides the largest cavity in the body, which may be regarded as the laboratory of digestion, the centre of never-ceasing chemical and vital changes. Its contained intestinal tube bears a striking analogy to the "worm" of a still, the only essential mechanical difference being that the concentrated nutritive elements are taken up from its walls by vascular absorbents which collect and deliver them to the general circulation. The contents of the abdomen, as we have seen, are so effectually protected from behind, that damage to its contents from this direction is rarely possible, however applied. Its broad muscular apron in its antero-lateral areas is capable of offering great resistance to force when notice of it is given.

The alimentary canal containing semi-solid, fluid, and gaseous elements, its anterior central surface emits a tympanitic note on percussion, and is therefore capable of considerable compression when this is applied gradually. Compressed from one side or the other, the contents of the abdomen meet with but moderate resistance against the muscular parieties. In compression applied over its dorsal wall resistance is quite complete.

Force applied directly in front encounters but a limited resistance from the recti or oblique muscles, and passes inward until it is suddenly arrested by the vertebral bodies or by the sharp edge of the promontory of the sacrum. The summit of the abdominal cavity, that part immediately under the diaphragm, is most effectually sheltered by two pneumatic buffers which so protect the organs in the epigastrium that their osseous braces, as a rule, fracture, and the lung with its serous investment suffers, while the abdominal viscera generally escape.

The integumental investment of the abdomen anteriorly, is thin, elastic, freely movable, and resistant. As its antero-lateral areas are without osseous underlying supports, in the application of force, the capillaries escape rupture, so that dis-

colouration or ecchymosis, so commonly following contusion elsewhere over bony surfaces, is generally absent in this locality. With the body in the recumbent position, the antero-lateral walls being composed of yielding material, on pressure being applied here they can be forced backward or inward until arrested by the central osseous ridge of the spine. But with the body lying prone on the face and chest, as but a very limited area of the abdominal boundaries is at all exposed, and this is so powerfully protected by the spinal muscles and the lumbar vertebrae, vulnerant force must be great and concentrated to produce disorganising effects on the abdominal viscera in this direction.

It is well to observe, also, that when a heavy substance is brought to bear on the lumbar region, the body resting prone on its anterior areas, concussive pressure is transmitted through the back, and is partly spent on the thorax and pelvis.

CONCUSSIVE AND COMPRESSIVE INJURIES OF THE ABDOMEN, MODERATE OR SUPERFICIAL.

The comparative frequency of injury of the various structures and organs of the abdomen will depend on first, their exposed situation; second, their composition; and third, the manner in which force is applied.

The structures which enter into the protecting walls of the abdomen and are the first to receive a violent impact, as we would expect, are those most often implicated by injury. The most marked exception to this rule, is the integumental envelope, which extends from the ensiform cartilage to the crest of the pubis and Poupart's ligament, and as far laterally on each side to the outer edge as the linae semilunares. Here the skin is thinner than anywhere else in the body, but its mobility and resistance are such, that rupture of its capillaries and consecutive ecchymosis are scarcely ever seen, even with very extensive damage to the parts underneath. The same peculiarity attaches to the skin covering the lower five ribs, and though costal contusion or fracture may occur,

ecchymosis seldom appears until reparative processes are advanced. But over either lateral plane of the lumbar region, and laterally over the lumbar fascia and oblique muscles, as far forward as where their fibers terminate in an aponeurosis, vascular effusion into the integument, with ultimate free staining of it, is a common event.

Striped muscular tissue in every region of the body offers remarkable resistance to trauma, and in none is this quality more manifest, than in that which supports and maintains the abdominal contents.

Although some authors maintain that contusions of the abdominal muscles are an uncommon event, my own personal experience has been to the contrary. The lesions here of a superficial character in their order of frequency and importance are :

1. Simple contusion, with or without sanguineous infiltration.
2. Sprain.
3. Laceration or rupture of muscle.

Simple contusions are caused by moderate blows or falls on any of the abdominal areas. Moderate soreness and tenderness follow, which pass away after a few days, as a general rule, without any constitutional disturbances. But when the force is moderately severe and falls are sustained on the ribs which enter into the thoracic wings, a most painful and protracted intercostal neuralgia may follow, which is aggravated by motion, respiration, or any spasmodic action of the diaphragm. The pain and tenderness succeeding moderate concussive force applied here, probably result from injury to the intercostal nerves. But in time it passes off without leaving any pathological changes in the affected parts.

Sprain or rupture of the abdominal muscles follows a sudden violent stretching of them. Such tension may occur from direct pressure, as when one is caught by some compressing agent, usually either below or over the epigastrium or over the lateral lumbar muscles.

For obvious reasons we can understand how an uncompli-

cated sprain is seldom seen over other areas of the abdomen. In severe sprains the aponeurotic investment of the muscle or even some of its fibers may give way.

These are most often encountered in the lumbar region, and here generally occur, in consequence of a sudden lateral inclination of the spine, the affected muscles being subjected to violent tension.

A severe muscular strain is always followed by a painful lameness in the affected parts, which is slow in recovery, though as a rule full functional power, after a time, is reëstablished. Rupture of a muscle with retraction of its ends I have never seen over any part of the abdominal walls, except where mortal injury was associated with it. The rectus is the most exposed to this lesion, and cases are on record in which rupture of it occurred by spasmodic contraction alone.

It is possible that a muscle may be partly or even wholly ruptured without detection. For example, in those whose abdominal muscles are masked by deep layers of fat or when the muscle ruptures within its sheath, when the interspace is slight, and when there is no hernia of its fibers through its thecal envelope. Inasmuch as no case of uncomplicated muscular rupture over the abdominal areas has come under my notice, and more than five thousand cases of traumatism have been examined by me, I am disposed to believe that it is a very unusual complication.

The flat, broad tendon of the external oblique turns on itself below, and with its fellow of the opposite side constitutes the centre of attachment, particularly of all the muscles lying over the anterior plane of the abdomen, except at the crest of the pubis, wherein the erecti are inserted, and a plaque of the external oblique contributes to the formation of Gimbernat's ligament.

Tendinous structures possess greater resisting power to violence than the muscles, as we observe in injuries of the extremities, when muscles will rupture from violent spasm or the tendon may drag away the very bone surface into which it is inserted, before it will itself give way. Where contu-

sion of the central organs is considered, the areas of the abdomen covered chiefly by aponeurosis are by no means the weakest.

Many attribute their hernial infirmities to blows or falls sustained some time in life over the inguinal areas. In fact, a common impression prevails that this is their usual origin. This is not surprising when we recall to mind the popular term *rupture*, which is applied to hernia and even yet persistently adopted by various modern authors.

But in an inguinal hernia there is nothing ruptured or torn, nor does hernia probably ever arise in consequence of blows or falls on the inguinal region. Of this I am assured from an examination of many of all ages who have sustained blows over the inguinal region. Nevertheless, if the injured has had hernia in infancy, or is the subject of one in the process of evolution, there can be no question but violence may hasten its development or impart serious features to it.

CONCUSSIVE AND COMPRESSIVE INJURIES OF THE ABDOMEN, CENTRAL AND SEROUS.

While peripheral trauma of the abdomen is not uncommon, deep or central is met with sufficiently often, and is so grave in its consequences as to warrant a careful consideration of it. This is particularly opportune at the present, since aggressive surgery has essayed to treat many visceral lesions of the abdomen by direct intervention. It has been quite generally conceded that operative surgery at present, in many pathological conditions within the abdomen, is a means more effective in prolonging and saving life than the more conservative constitutional measures in vogue, before the time when anaesthetics, antiseptics, and experimental studies had made it a permissible procedure to open the abdomen in the living subject.

How far similar radical surgical procedures may be utilised in those contusive injuries, associated with the laceration or rupture of the organs, it is highly important to determine.

The above may be divided into two varieties :

1. Percussive or concussive.
2. Compressive.

Percussive or concussive force is an etiological factor of great importance in many of the grave injuries to the deep viscera, and especially to the solar plexus. The abdomen may sustain the impact of a quickly moving body, as a ball thrown with great impetus, an arrow, a spent missile, or in fact any projectile moving with great velocity, which will reduce a solid viscus to a pulp, rupture the intestine, or widely open the vascular structures, and yet leave no trace of injury at the point where it struck the integument.

Thus in one case that came under my care in hospital nine years ago, a burglar was fired on by a policeman as he was escaping through a window. The shots were fired from a thirty-two caliber revolver at a range of about thirty feet. After the second shot the burglar fell back into the room. He was immediately sent into the hospital. He was seen by me three hours later. He was then in mortal shock, and incessantly groaned from pain in the abdomen. On examination it was discovered that he had apparently been shot in but one place. This was through the deltoid, the ball passing completely out. But his urgent symptoms were abdominal. Here, however, there was no discoloration to indicate contusion, though on examination it was evident that he had a large internal haemorrhage. He died six hours after admission. On post-mortem examination the coeliac axis was found widely opened, and the jejunum was nearly torn in two just where it emerged at the left, under the cardiac end of the stomach. The cavity of the peritonaeum was flooded with blood and the intestinal contents.

The sympathetic ganglia and solar plexus receive many communicating filaments from the vagus and the internal terminals of the anterior division of the spinal nerves from the lower dorsal region of the cord. This may, perhaps, partly explain why a sudden severe blow over the epigastrium produces such an impression on the cardiac and respiratory centres.

There are few males who pass through life who have not experienced that sensation of great distress which follows percussion or a fall on the upper abdomen. The immediate sensation is inability to breathe for a moment, when it is said one has "had the breath knocked out of him." In the more aggravated cases, syncope follows with great prostration and nausea.

Taylor sets this type of injury down as an occasional cause of death; for in writing on the subject he says: "There is no medical doubt that a person may die from shock without any external evidence of injury being found after death."[1] Mr. Hogden is emphatic in his statement that death may immediately follow an injury of the abdomen, without any external or internal evidence of it being discovered after death.

"There may be," he says, "a slight abrasion or contusion mark on the skin, but these are neither constant nor necessary accompaniments of the blow. Convictions of manslaughter have taken place under these circumstances.[2]" Mr. Alfred Poland, in his prize essay on the subject, said that "the upper part of the umbilical and epigastric regions contains such vital structures, and above all, the solar plexus and its numerous branches, of such high organic importance, covered in by soft parieties, but little capable of receiving or transmitting external shock, that it is not to be wondered at that death may be the immediate consequence of injury in this region." We are told that in the March circuit at Cambridge, England (1857), John Bond was indicted for the murder of his wife. He beat her violently over the stomach with a six-pound codfish. She died almost at once after the first few blows were delivered.[3]

Austin Flint (2nd) records a case of death resulting from a blow over the epigastrium. The patient was a young man who had been hit playfully by a fellow waiter. Flint made the post mortem examination and declared that he could find nothing to account for death.[4] Chavasse in one hundred and forty-nine observations, on deaths from abdominal injuries,

[1] Medical Jurisprudence, p. 317, 1880.
[2] Abdominal Injuries, Holmes' System of Surgery, vol. i, p. 884.
[3] Holmes' Surgery, vol. i, p. 885.
[4] Human Physiology, revised ed., p. 912.

reports thirty-six of them as having been induced by kicks from horses and thirteen by kicks from men. Guthrie records the case of a male infant, which was projected up in the air about six feet, his father catching him, as he came down, over the abdomen, his thumb projecting upward. The infant died almost instantly. On autopsy an extensive rupture of the intestine was found.[1]

Can a blow on the stomach or anterior abdomen produce death, without producing such pathological changes as can be traced or detected after death?

In this materialistic age of ours, when it is assumed that symptoms are always but the expression of organic changes, and when facilities are at our command for purposes of rigourous analysis, it might seem that a prompt and definite answer could be given to this question. Still, truth demands that, however humiliating it may seem, it must be confessed that there are a multiplicity of morbid manifestations which have no tangible, visible organic changes that will account for them. Their fountain head is the nervous system and vital processes. Possibly those rare cases of sudden death after a blow on the abdomen, belong to this category. The anatomical, physiological, and vital relations between the stomach, heart, and brain are most conspicuous, and these are always most clearly accentuated, in what we designate functional maladies. In my search through the authors for evidence to support or refute the assertion, that death may follow a blow on the epigastrium, the results were unsatisfactory, for there was great discord of opinion, and in some works by eminent surgeons, which were examined, this class of injuries were scarcely mentioned.

The general tenor was in the direction of skepticism, and anything approaching a positive opinion could be found in only rare instances.

I could find no author who had ever had a well-authenticated case in his own practice, though there was no paucity of hearsay evidence and ingenious theorising.

[1] Guthrie's Principles of Surgery, p. 217.

Ashurst[1] says that "since Pollock's researches, it appears doubtful if rapid death can follow abdominal injury; though there can be no question, but rapid death may follow those injuries, either from concomitant shock or from a condition of the solar plexus analogous to cerebral concussion; in either case, however, there would probably be physical lesions after death." This statement is so ambiguous as to carry no positive force, for every one knows that certain abdominal injuries are quickly mortal, but they have a definite pathology. The physiological comparison between the solar plexus and the brain will not hold.

Mr. Thomas Bryant[2] is scarcely less equivocal on this point. He says that "under certain circumstances, a trifling blow on the abdomen may give rise to symptoms of an alarming nature . . . the absence of shock may lull suspicions;" and he adds, "however trivial an injury of this kind may seem, it should be regarded with apprehension and the utmost caution and care manifested in its treatment. How far," says the distinguished writer, "sudden death is attributable to shock or collapse from a blow on the abdomen without organic lesion, is an open question."

Le Gros Clark[3] maintains that shock in itself is not a reliable criterion of how extensive a deep lesion may be, and warns us not to be too precipitate in making a favourable prognosis.

Agnew was reserved on this question. Dr. Sanborn's case, which occurred in Lowell, Mass., is interesting in this connection. The patient was crushed against the side of a house by the handle of his hand-cart hitting him on the stomach. He felt faint for a moment, but pushed his cart into the shed. Violent symptoms followed, and he died in forty-eight hours, when a large rent was found in the small intestine.[4]

Pirrie believed that blows received over the stomach or

[1] System of Surgery, p. 391.
[2] Treatise on Surgery, p 278.
[3] Surgical Diagnosis, p. 207.
[4] Boston Medical Journal, May 12, 1859.

duodenum were more dangerous than those in other situations.[1]

Miller observed that a contusion of the abdomen, though it might leave no visible marks on the integument, yet might do great internal damage; and further, when the deep viscera escaped the chances were that in consequence of the damage to the abdominal muscles, atrophic changes and weakening were quite certain to follow.[2] Le Gros Clark adds that "if the doctrine be true, that a blow on the abdomen may cause death, it must be a very rare accident." Holmes practically repudiates the doctrine *in toto*.[3]

Hunter McGuire, of Virginia, has reported a case of a soldier who was killed by a spent ball hitting him on the belt over the abdomen. On autopsy nothing was found to account for death.

Guthrie believed that violent blows over the anterior abdominal muscles might lead to their ultimate absorption and relaxation, thereby favouring the advent of hernia, without rupture of muscle fibre. He cited such cases in his own practice.

Gant adds his testimony to the probability of blows over the abdomen causing fatal results, and says that "wasting and weakening of the abdominal walls is one of the consequences of severe percussion here."[4]

With a view of determining as far as possible the views of surgeons on the question of contusions of the abdomen in recent times, since surgery of this region has so largely occupied the attention of the profession and operations have been performed on a prodigious scale, an examination was made of nearly all the leading contemporaneous exchanges, domestic and foreign, that have been issued during the past fifteen years.

The most conspicuous feature in the search was the singular scarcity of cases chronicled. It may be said that during

[1] Principles and Practice of Surgery, p. 598.
[2] Practice of Surgery, p. 216.
[3] Encyc. Surg., vol. ii, p. 854.
[4] Science and Principles of Surgery, vol. i, p. 532.

this period the subject of abdominal contusions has not received the attention which its importance merits.

During that space of time there was no case recorded of death from abdominal contusion which was devoid of pathological lesion.

It may be said that in recent times the general tendency of the profession is to deny the possibility of death from an abdominal contusion without tangible evidence of disorganisation of structure.

Modern studies, research, experimentation, and personal observation all tend to discount and repudiate the assumption that the death of a man in sound health is possible by a blow anywhere over the abdomen without gross structural lesion succeeding.

Mortal concussion of the brain at the present is denied by many of our ablest authors. And concussion of the spine without serious central changes has been incontestably and conclusively proven to be little more than a mere myth. Probably concussion of the abdomen rested on an equally shaky foundation, and has had practically nothing to support and perpetuate it other than the parrot-like practice of the past in copying from one work into another notions which were wanting the stamp of personal observation, and had nothing to support them except their hoary antiquity.

CONTUSIVE AND COMPRESSIVE INJURIES OVER THE ANTERIOR WALLS OF THE ABDOMEN, INVOLVING THE DEEPER ORGANS.

Although since 1882 but comparatively few cases of the description here considered have found their way into current medical literature, yet they constitute a considerable share of all traumatisms in every hospital.

They are not, however, by any means as common as injuries of the head or thorax, though an equal or greater surface is exposed. This is because, as heretofore explained, it is best capable of resisting injury.

The consequences attending or following an abdominal bruise will always depend on various circumstances.

1. The region which has sustained impact.
2. The volume of force and its quality.
3. The structures involved.

Authors variously classify these lesions, but for all practical purposes they may be reduced to two groups, viz.: (*a*) superficial, (*b*) deep.

The inflated abdomen is elastic, resilient, and resistant. We have but a vague conception of the extent of abdominal resistance and propulsive power, until we have an opportunity to observe it in the partrurient act, or when we have opened the abdomen in the living man and observed the tremendous energy sometimes required to hold the intestines back when violent retching sets in and all the abdominal muscles are brought into play.

Local abdominal bruises are often witnessed. Blood may be extravasated into the muscle's sheath and cellular tissues, nerves lacerated, and tendons strained.

In this class recovery is rapid and full function quickly restored. Parietal lesions of a more serious character may, however, follow later on.

Rupture of the muscle may succeed. In one case, cited by Camper,[1] the rectus was lacerated and the internal epigastric artery opened, the patient sinking in six hours from internal haemorrhage.

Inasmuch as the abdomen is not equally protected, its contents varying in mechanical resistance, in their vulnerable qualities, and in their exposed position, it follows that the effects from the same volume of force must vary according to its point of impact. Thus, when a blow is delivered over the scrobiculus cordis or over the great centres of the sympathetic or the pneumo-gastric, and in close contact with the cardiac organs, we may expect greater shock and functional disturbances than if the same volume of force were delivered over the loin or elsewhere.

[1] Contusions de l'Abd. An. Ch.. vol. viii, p. 712.

A blow directed obliquely would be capable of less disastrous consequences than one aimed directly over the median axis of the abdomen in the direction of the vertebral column.

Violence applied over the walls of the thoracic vault of the abdomen, when not too great, is reflected back by the elastic lung and ribs.

It is probable that pure concussive force, however applied to the abdomen, is always so diffused as to impinge equally on all the floating viscera.

But with the *direct compressive* quality, as will be seen, the damage is sustained at a point in close vicinity to where violence has been applied.

Indeed, there is no proof that there ever is disorganisation of the viscera by *contre-coup* force in abdominal injuries, as we often witness within the skull.

It is clearly evident that in all abdominal as other injuries much depends, not only on the volume of force, but the manner in which it is applied.

Percussive force, as kicks or blows, derive their destructive quality from their velocity, and the limited area of their impact.

Blows on a hollow viscus which is distended with gas or liquid, as the small intestine, the bladder, or stomach, may cause a rupture of it.

This same quality of force, when brought to bear on a solid organ, shivers or lacerates it, perchance reducing what it strikes to a pulp.

Compressive force is slower in action, and probably attended with less danger to life than the former. Owing to this characteristic, movable organs are permitted to shift into such situations as will afford them most protection, besides adapting themselves to best resist danger.

This, perhaps, may explain why the distended stomach and intestine so often escape after great weights have passed over the abdomen.

But the effect of a crush, as a buffer accident or under other circumstances, is widespread, and produces a lesion which

may involve a whole organ and contiguous structures. Thus, in a man crushed by a loaded cart-wheel, under my care a year ago, there was coincident laceration of muscle, omental haemorrhage, rupture of the ileum, and contusion of the right kidney. The shock following compressive injuries is sometimes very great, though in my experience it is not so dangerous as that seen in the concussive variety.

If we proceed from above downward, we will observe that the spleen and stomach are best situated to escape force, the latter particularly when collapsed and contracted.

The liver, too, is well sheltered. The gall-bladder is most exposed, and hence is often damaged. But when great force is applied over the floating ribs on the right side the liver is crowded against the spine and lacerated. Rupture of this organ is serious because of its great vascularity and the danger of mortal haemorrhage following. The same may be said of the spleen. In the umbilical region the ileum lies close to the abdominal walls, and is in great danger in the event of injury.

Certainly, all will depend on whether more than one or two of its coats have given way, and whether the rent is a small or large one, possibly also on whether its leakage consists of gaseous or liquid elements.

The vertical segments of the colon are so well protected that they seldom rupture. When they do their faecal contents excite prompt, septic inflammation. As has been observed, the kidney is frequently injured. When the trunk is seriously contused or compressed over the lumbar spine, and when great force is applied over the loin anteriorly it may also suffer contusion. Although it is peculiarly vulnerable, it likewise possesses marvelous recuperative power; but when its large blood trunks are opened death may follow by rapid exsanguination, the blood draining off either by way of the bladder or infiltrating into the connective tissues.

The organs of the pelvis are safe from harm unless their osseous shell is crushed in, or they are distended and rise

into the abdomen, as do the impregnated uterus and the enlarged bladder. Rupture of the bladder, when the tear is complete through all its coats, is a serious accident, though it is a rare one which but few ever witness. The ureters, choleducts, pancreatic duct, or the thoracic duct are sometimes ruptured when more superficial organs entirely escape.

A case of rupture of the common bile duct has come under my care, which was caused by the patient being run over. The case ended fatally on the sixth day, and on autopsy a rupture of the common duct was found, though all the neighbouring organs were sound.

A case of rupture of the thoracic duct came into my service last year, caused by a run-over accident, the patient recovering. Traumatic rupture of the ureter has been reported.

The vascular system is nearly always implicated in all serious abdominal injuries, and the presence of a large haemorrhage in many is a contributory cause of death.

AETIOLOGY.

There exists some divergence of opinion on the causative factors in bruises of the abdomen. Extensive studies have been pursued to elucidate this feature of the subject, yet much remains unsettled.

The most complete and the only methodical series of experiments ever conducted in this country on the lower animals, with a view of elucidating the subject of abdominal contusions, known to me, was published by Dr. B. F. Curtis.[1]

These experiments were further amplified by others on five or six cadavers. Forty-four dogs were experimented on, contusive force alone being employed in all. The abdomens were traumatised by allowing pieces of wood and iron to fall on them, the animals being etherised. In ten no serious harm followed. In only eight was the intestine ruptured. None was immediately killed by the blows.

[1] American Journal of Medical Sciences, October, 1887.

This author's observations on the cadaver showed that the jejunum and upper part of the ilium were most exposed, and that when one of the hollow organs was ruptured it was caused by being crushed against the spinal column. In 116 collected cases by this author most were injured by kicks and run-overs; but four were buffer injuries. Areas of the intestinal canal were involved in 113 cases; in the duodenum, 10; jejunum, 44; ilium, 34; other parts of small intestine, 21; colon, 4. Shock was present in 80 per cent.; severe pain in 104 cases.

Early in the spring of 1879 Professor Giornadi, of Genoa, made an extended series of similar observations and experiments on the lower animals for the purpose of endeavouring more precisely to determine the causative factors in injuries of the abdomen.[1] As a result of his remarkable experiments, of which space will not permit a detailed account, he summarises briefly as follows:

1. When such a degree of violence is applied over the abdominal wall as will lead to intestinal rupture, the mucous and muscular layers are the first to give way and the fibro-serous last.

2. This being the case, rupture of the inner coats with haemorrhage into the bowel does often occur, when the peritonaeal investment has preserved the continuity of the lumen, prevented extravasation, and favoured repair.

3. When the bowel has suffered very serious damage, though there may be no immediate rupture, perforation may occur through a gangrenous patch any time from five to ten days or later.

4. Mechanical rupture of the intestine, complete or incomplete, either alone or in conjunction with laceration of the solid viscera, follows not from *contre-coup*, but by direct impact against the vertebral bodies.

Moty divides abdominal contusions into three classes, based largely on their etiological elements.[2] The author sums up

[1] "Effets de Coup Violent sur l'Abdomen," Gaz. des Hôpitaux, May, 1879.
[2] Revue de Chirugie, No. 11, 1890.

with a warning not to be premature with a favourable prognosis, in view of possible complications which may subsequently unexpectedly arise.

Prof. Charles McBurney[3] reports a highly interesting case of a boy who fell on his abdomen, striking a rail on a railroad. Shock was very marked. He was injured at 3 p. m. McBurney and the consulting staff decided to operate at 11 p. m., intestinal perforation being suspected. Found abdomen full of blood, with laceration of the gastro-duodenal artery. Intestine not injured. The patient recovered. It would seem remarkable that a fall, or rather stumble, could cause a rupture of such a vascular structure. The majority of abdominal injuries are caused, not by contusion from blows, but by compression such as in run over cases, the abdomen being crushed violently between two hard resisting bodies, as under wheels, between two cars, the so-called "buffer injuries," being caught under falling bodies, etc.

In conjunction with abdominal injury in this class, we will often meet with fracture of bone as a complicating element. In this class, as in contusions, the weight of testimony is that in the vast majority of cases the abdominal contents are lacerated, not by concussion or percussion, but by the intestine or other organ being driven back or downward with great force, against the vertebral column or the pelvic ridge.

DIAGNOSIS.

The diagnosis of intra-abdominal traumatisms, as with those of a pathological order, is generally attended with very many difficulties. In no case is there any reliable and safe means known, by which it is possible either to detect or locate complete rupture of any part of the alimentary canal within the abdomen.

If there were a definite symptomatology, in many instances it would avail us nothing, when it is remembered that the tendency of an injured intestine is to take on immediate

[3] New York Medical Journal, January 26, 1889.

spontaneous adhesive inflammation, and thus effect a cure without interference; spontaneous union here being remarkably and singularly efficient when not disturbed. Besides, in many, general shock is very great and impending collapse so threatening, that radical measures may and often do deprive our patient of his only hope of recovery.

In the near past it was heralded far and wide that an exploratory abdominal incision under aseptic or antiseptic precaution was harmless. But time has proven that this was both a dangerous and fallacious assumption, and that no means known to art will in any manner whatsoever obviate the dangers inherent in an abdominal section made while a patient is under shock.

Stimpson's statistics have demonstrated conclusively that in gunshot penetrating wounds of the abdomen the mortality was largest when active intervention was adopted. Réclus and Berger's observations[1] were in the same direction.

Bryant gives the records of 74 severe non-penetrating injuries of the abdomen admitted into Guy's Hospital in eight years. In 44, beyond a passing shock, they rapidly recovered and no bad symptoms followed. Three had peritonitis of an acute type, one terminating mortally. In 17 it was believed that rupture of the viscera took place. The author cited the case of a man among the group who, in a fracas with a woman, was hit violently over the stomach. He immediately collapsed, but quickly rallied and went around for a week, when acute peritonitis followed, from which he ultimately recovered.[2]

Morton collected 234 cases of abdominal bruises, in which he found that the digestive tube was injured about once in eleven cases or in less than 10 per cent.[3] Jalugeries's tables comprise 345 cases of intestinal rupture. The stomach was ruptured but once. In their order of frequency of rupture

[1] "Penetrating Gunshot Wounds of Abdomen," New York Medical Journal, January, 1889.

[2] British Medical Journal, May 12, 1892.

[3] New York Medical Record, July 6, 1889.

the small intestine came first and the various segments of the colon next.[1]

Michaux[2] cites three grave cases of abdominal contusion. One refused laparotomy and died; the other two submitted. Internal perforation was found in both. Recovery followed in each.

This author dwells at length on the difficulties in diagnosis. He would advise delay in all cases of shock.

When in doubt he would not operate. Exploratory incision for diagnosis he disfavours, but where reaction sets in and septic peritonitis is formed he would promptly laparotomise. Tillaux, in a valuable contribution on these injuries, observes that at the time of accident exact diagnosis is extremely difficult on account of shock, which may be dependent on causes quite independent of the abdomen, and various pathological conditions within it.

"The aspect of the abdominal walls," he truly says, "furnishes us with no definite knowledge of the pathological condition within the cavity." A man was brought into his service who had been injured over the abdomen. There were no surface indications of traumatism. He died in shock. On autopsy it was found that the greater part of the mesentery was torn off and a vast haemorrhage had accumulated. After shock passes away he says that "the facial expression independent of the temperature is quite pathognomonic of peritonitis."[3] From the preceding observations it is obvious that symptomatology is anything but clear in these lesions. It is important, however, that when it is possible a definite diagnosis should be made, and as soon after injury as is practicable.

PATHOLOGICAL ANATOMY.

The events of an abdominal injury which threaten life are (1) haemorrhage, (2) intestinal rupture, (3) peritonitis.

[1] "Contusion de l'Abdomen," Bulletins et Mem. de la Soc. de Chir. de Paris, April, 1893.

[2] Contusion de l'Abdomen, Perforation Intestine Laparotomy.

[3] Gaz. des Hôpitaux, October 7, 1886.

Haemorrhage within the peritonaeum in some respects is not unlike that into any other serous cavity. Bleeding within the skull, the pericardium, or the pleura imperils life, not by its loss so much as its mechanical effects, irritation, etc.

But within the peritonaeal cavity, as its walls are distensible and its contents movable, this does not obtain. The loss of blood in this cavity may be quickly fatal through its volume alone. Intra-peritonaeal haemorrhage is no doubt more common in abdominal traumatism than is generally supposed. In moderate quantities no serious harm follows. But when a solid organ is cut or a large vessel opened, the escape may be large and the consequence serious.

In most cases, when the loss of blood is great, we may determine its presence by physical signs as well as through the general symptoms. Its most striking clinical characteristic is the great diminution of the vital powers.

In shock from intestinal rupture great pain is superadded. In haemorrhage, too, thirst is urgent and nausea is wanting. The amount of haemorrhage will depend on the structure opened.

Mr. J. T. Taylor[1] gives the history of a boy who sustained a blow on the abdomen, dying in syncope almost immediately after. On autopsy the aorta was found ruptured, just above the bifurcation into the common iliacs. But the vascular structures may suffer serious damage in these cases without the loss of blood, as is proven by Malgaigne's case of a man who had sustained a violent blow over the hypogastrium. As this man recovered from shock and began to regain his strength, symmetrical gangrene commenced in his lower extremities and he soon died. Post mortem: The abdominal aorta was found occluded by a massive clot and both of its inner coats ruptured.[2]

Haemorrhage into the peritonaeal cavity will gravitate, but that of a renal origin will lodge in the retro-peritonaeal

[1] Lancet, May 7, 1883.
[2] Bull. de l'Academie de Med., June, 1894.

tissue of the flank and hypogastrium, though in some the leak is into the pelvis and out of the kidney with the urine. There is no distinctive symptom which will always definitely indicate what organ or tissue intra-peritonaeal haemorrhage is derived from, hence our hypothesis must rest on an *ensemble* of symptoms, rather than any single one.

Since the recent era of revival of intestinal surgery and since, and under the new *régime* of antiseptic therapy, several enthusiastic investigators have insisted, with great emphasis, that the early recognition of intra-peritonaeal haemorrhage is of prime importance, in order that its source may be sought out and effective haemostasis instituted.

However, time has demonstrated what has been well known for ages, viz., that intra-peritonaeal effusions of blood were rapidly disintegrated by the lymph, and that the serous membrane resorbs it with great rapidity. We have further learned from observation on the human body that when the portal vein, the vena cava, or aorta is lacerated, little can be accomplished by an abdominal section. *Intestinal perforation* or rupture may occur as a primary lesion after severe injury of the abdomen, or consecutively. The detection of an intestinal rupture by any series of symptoms immediately after injury, is quite out of the question, though the presence of great pain is strongly presumptive of it. It may be suspected when shock deepens with agonising distress, when the eyes are sunken and the features are pinched. More than once has a mortal case of perforation been witnessed by myself, when there was little or practically no shock, and, on the other hand, in not a few the most profound shock; and subsequent acute peritonitis has been observed, but no mortal perforation followed. As a general rule, however, the persistence of violent pain with great depression and nausea, is a fairly reliable indication of intestinal rupture.

Inflating the alimentary canal from above or below may perhaps aid in the diagnosis, but it must be regarded as an expedient attended with dangers that more than counterbalance the additional knowledge it may convey.

It remains a question thus far, whether we should be contented to wait, when we are in doubt, until reaction sets in and symptoms are better accentuated, or press for an exploratory incision. It goes without saying that when such an incision is made, preparation for simultaneous treatment of the rupture in the bowel, if one is found, should be complete.

But it is a procedure of so much difficulty and gravity that it should not be undertaken without deliberation, and never by any one other than an experienced surgeon, if such can be had, for sometimes the point of leakage, though easily recognised, is situated in such a part that operative treatment of it is quite impossible in any but experienced hands.

PERITONITIS.

Peritonaeal inflammation of a traumatic type follows (1) from contusion alone, (2) from haemorrhage, (3) from leakage of the gland ducts or alimentary canal. Parietal peritonitis is eccentric or centric; in the former irritation being conveyed inward by the lymphatic vessels from peripheral injuries. This variety is as common as it is generally harmless. It is always associated with a peripheral cellulitis. It is not painful unless the body is moved or when the diaphragm is suddenly contracted. It may be local or general. No paresis of the viscera occurs in this form unless the hypogastrium is the seat of inflammation; when the extension of the reflexion of peritonaeum over the fundus of the bladder is involved, we will have vesical paresis and retention of urine.

Central, or perhaps what should be more properly designated *visceral*, peritonitis is altogether a more serious affair, and is usually ushered in by a set of symptoms of moderate severity. Such is that which follows the irritation of a large haemorrhage, a moderate bruising of the intestine or fixed viscera, slight leakage of gases or fluids from the intestine, or the various ducts, or the gall or urinary bladder.

When the peritonaeum is inflamed one of the most unvarying symptoms is arrest of peristalsis. The patient is consti-

pated and perhaps incessantly vomits. Besides, he has the usual syndrome of fever. The pain of peritonitis is generally of a most agonising character, and is not apt to be mistaken for anything else. Along with those symptoms are the cadaverous features, the painful suspense and mental anguish.

It may be said that peritonitis of various types is an invariable concomitant of all grave abdominal injuries which run into the stage of reaction.

When the bladder is distended it rises into the abdominal cavity, pushing the intestines upward and backward. When thus filled it lies close to the abdominal walls and is exposed on violence to rupture, though the healthy organ possesses remarkable resisting qualities to injury even when greatly distended.

It is quite possible that diminutive rents in its walls occur more commonly than we suppose, but that, owing to its tendency to spontaneous repair and the facility with which the peritonaeum will absorb aseptic urine, we do not discover them.

Several cases have come into my hospital service for operation, which had been diagnosticated as bladder rupture. The patient had been crushed or run over some time before. Not being able to urinate, a practitioner being called would possibly introduce a gum-elastic catheter. He would find that this would go in a great distance, but no urine would flow, and hence the patient would be hurried off to hospital for laparotomy.

On entrance a careful external examination would reveal a vast zone of dullness which could be marked off over the hypogastrium. A large catheter would be introduced and a suction applied to withdraw the blood-clots. From one to three pints of urine might be withdrawn, and that would be the end of the trouble. In another class of cases in men after injury over the lower abdomen, they will complain of great pain in the bladder. Now, if one is not cautious, he may again diagnosticate rupture, though the bladder this time is empty and flaccid. A hard catheter will be passed

in and its tip may be felt anywhere over the hypogastrium, up as far in the centre as the umbilicus.

I was notified about a year ago that such a case was in the hospital in need of urgent laparotomy for rupture. By telephone I directed that the bladder should be distended with six ounces of sterilised water, which was then to be withdrawn. This was done, all the water coming back as it entered, unchanged, in the same exact quantity. This is a simple and accurate test when one is in doubt. What causes the deception in these latter cases is the flaccid wall of the bladder receding away before the top of the catheter. In those cases of suspected vesical rupture, a diagnosis may be made of intra-peritonaeal perforation, and the general peritonaeal cavity must be opened to reach the seat of injury. To open this under a mistaken diagnosis might cost the patient his life, and possibly involve the operator in very serious legal proceedings.

Treatment.—"In the treatment of this class of cases no general line can be laid down; no canon can dictate our course."[1]

As the greater number of cases of abdominal bruises present no serious features, they should be treated on general principles. *Rest* occupies a place of prime importance. Our patient should be placed in such a position as affords the greatest comfort. Nature itself enforces this decree.

The strained, lacerated, and contused muscles of the abdomen refuse to act without a protest, for the least movement of them gives excruciating distress. The activity of all the functions of the economy is sensibly diminished. Breathing is shallow.

The heart's stroke may be increased in frequency, but its impulse is weakened. Secretion and excretion reduce their output, the appetite temporarily fails, the injured patient seeks undisturbed quiet; the plain and emphatic admonition, then, is *rest*.

Protracted manipulation and the institution of tedious

[1] Hodgen on "Abdominal Contusion," Holmes's System of Surgery, vol. i, p. 891.

diagnostic tests may add much to the patient's sufferings, and are prolific sources of augmented distress.

If our patient is not in shock, but suffers pain and is not very weak, our relief measures will be simple. If pain is but moderate peripheral local applications will give relief, and in a few days our patient will be up again.

In another class, in which the degree of injury is greater and shock is present, the same principles will apply, but as there generally is great depression and severe pain, stimulants and sedatives are demanded. Heat to the extremities, with alcoholics and opiates, is now called for.

When alcoholics can be borne they are of infinite value, if judiciously administered. They exhilarate the drooping spirits, reduce pain, and favour sleep. In cases of severe abdominal pain, morphine must be conjoined and freely administered; but we must be cautious not to narcotise and in this manner destroy the life we are endeavouring to save.

A broad binder over the abdomen in some cases gives great comfort, but where there is a tendency to tympanites the belly must not be encumbered by any description of compress. It is highly important to bear this in mind in male cases, for with them respiration is diaphragmatic. Hot or cold application over the abdomen, according to which gives the most comfort, should be applied.

My own experience has convinced me that mercury freely administered early after traumatism exercises most potent properties in preventing or greatly modifying inflammatory processes in serous membranes. In these cases it should be employed by *inunction*, and continued until the gums are touched or the danger of general peritonitis is past.

Surgical Interference.—But what shall be done in those grave cases in which we are reasonably assured that there is a large haemorrhage or rupture of the bowel?

As heretofore stated, the general opinion now is, that one should not laparotomise during shock. There are aggressive young surgeons who would allow almost nothing to stay their hand were they only certain of intestinal rupture.

We may gather an impression of the extremes in this direction from the following paragraph by Dr. J. D. S. Davis, of Birmingham, Ala.:[1]

"There are those who condemn all mechanical aids for intestinal repair; know not how to use them, never saw them used, refuse to indorse a resection for a gunshot or stab wound, and are known to go on the stand for purposes of condemnation and disproval when they know no more about intestinal surgery than a wild Indian about school-teaching."

Contemporaneous surgical literature chronicles some few successful cases laparotomised for rupture of the intestine following contusion of the abdomen. The worst of it is that some surgeons who have had bad results are often swayed by motives of expediency and policy not to publish all their failures; hence no reliable table of statistics can be had.

Michaux lays down rules for our guidance based on his own extensive experience and supported by such rational deductions that it has seemed to me they may be, in part at least, adopted here as our safest guide when we are called in to treat this class of cases.

"Interfere at once," he says, "when there are unequivocal symptoms of perforation or large internal haemorrhage, for however deplorable such intervention may be, it is our patient's only hope."

He most judiciously insists, however, that in the vast majority of abdominal injuries the internal organs escape, though immediately after injury it may be difficult to distinguish the milder from the more grave type.

For this reason, in the average case he recommends delay until symptoms of peritonitis appear, when the indications for interference are formed.

He severely condemns exploratory incisions until the time arrives that symptoms of serious internal trouble are present.

[1] "Medico-Legal Aspects of Intestinal Surgery," Boston Medical and Surgical Journal, January 28, 1892.

This is usually within twenty-four hours after the injury, but it is often a difficult matter to correctly determine.[1] Up to 1893 there were but seven cases on record, according to this author, in which laparotomy had been performed successfully for rupture of the intestine following contusion of the abdomen; one each by Moty,[2] Croft,[3] Taboda,[4] Tahodo,[5] Michaux,[6] Ch. Nelaton,[7] Michaux,[8] Bouffin.[9]

Moty, when reporting a case of mortal contusion of the abdomen in a boy who was kicked by a horse, comments on the many difficulties attendant on diagnosis in abdominal injuries. He declares that the proper course of conduct in this class of cases is not yet definitely determined, though the general rule at present which obtains among surgeons is to laparotomise when there are good grounds for suspecting intestinal perforation; but he nevertheless maintains that "when we are in doubt an exploratory incision is not permissible, and the expectant or medical treatment should be the rule."

Mr. Stanley[10] has reported two serious cases of abdominal injury, one recovering and one dying. No operation.

Chavasse[11] collected 149 cases and noted that mortality in conservative treatment was about 30 per cent. In McKenzie's[12] 111 cases with tentative measures the mortality was 6 per cent. In one of them the stomach was ruptured, and in another rupture of spleen.

Krause, at the Anatomical Society of Paris, presented the report of a case of violence to the abdomen of a man in whom the question of laparotomy had been raised. Patient died in eighteen hours, and on post mortem examination it was found

[1] Gaz. Fev., Mai Arvil 12, 1892.
[2] Bull. de la Soc. de Chir., January, 1890, No. 1, p. 48.
[3] Chir. Soc., London, March 14, 1890.
[4] Wien kl. Woch., 1891, No. 45, p. 837.
[5] Wien kl. Woch., 1891, No. 46, p. 839.
[6] Bull. de la Soc. Chir., January 27, 1892.
[7] Bull. de la Soc. Chir., October, 1892.
[8] Bull. et Mem. de la Soc. Chir., 1893.
[9] Congrès Francais de Chirurgie, 1893.
[10] Vol. xxvii, Med. Chirurg. Trans.
[11] Contusion de l'Abdomen, Memoirs de l'Acad. de Med., January, 1872.
[12] Med. Trans., vol. xiii, p. 207.

that the duodenum was ruptured and the abdomen badly contused. Dr. W. B. Corson[1] published the case of a boy who had been kicked on the abdomen by a horse. He was seen ten days later, when he was moribund. On autopsy a rupture of the ileum was discovered, with free escape of its contents into the peritonaeal cavity. He favoured early incision when patient could safely bear it.

The same author cited Dr. J. Gregory's case of a boy who fell but four feet, striking his abdomen on the edge of a ladder. In six hours death followed. An extensive rupture of the ileum was found near the caecal junction.

Joubert,[2] while dwelling on this topic, says that direct compressive force against the vertebral bodies is the preponderating cause of intestinal rupture; and adds that the repair of such an opening is very frequently satisfactory and prompt by adhesion of the damaged wall to its healthy neighbour.

Tillaux, while a strong advocate of abdominal section in appropriate cases, nevertheless dwells with considerable fullness on the remarkable tendency of the peritonaeum to take on adhesive inflammation. He would immobilise the intestine and administer opium with a free hand.

Mr. Edmund Owen, in "St. Mary's Hospital Reports," gives an interesting summary of the case of a man who was injured by a fall on the abdomen. Was seen by him the morning after injury. He had peritonitis and symptoms of a ruptured intestine, but patient was in shock when seen. On the following day symptoms aggravated. Now, with patient's concurrence, the abdomen was opened and a large rent in the intestine found within six inches of the head of the colon. Patient rallied fairly well but sank about six hours after operation. Mr. Owen thought that an earlier section might have saved his life; and concludes that in cases of an extensive rupture of the bowel death is sure to result, while a timely operation offers the only hope of saving life.

In a considerable number of grave injuries of the abdomen,

[1] Jour. Am. Med. Ass'n, November 5, 1887.
[2] Traité de Maladies Chirurgicales du Canal Intestinal.

symptoms of intestinal extravasation occur only as secondary phenomena. The intestine has been severely contused, on perhaps only a limited area of its wall; gangrene or ulceration follows any time from three to ten days, and a fulminant type of peritonitis follows.

Probably in this class of cases in which primary shock has been survived, the best prospects of good results follow laparotomy. Judging from the accumulated reports of laparotomies necessitated by abdominal contusions, it must be admitted that the prospects of success following them are very discouraging, and that the cases which demand them are so depressed from a general collapse that a major operation is generally succeeded by a fatal termination.

As may be conceived, the mechanical therapy of visceral traumatisms within the abdomen is not always very difficult. But the great impediments to its success are the terrible tendency to additional shock after the peritonaeum is opened and the imperative necessity for celerity of manipulation. Besides, notwithstanding what may be said to the contrary, peritonitis invariably follows every time the cavity of this sensitive serous membrane is opened, constituting in itself a fresh element of danger to life.

We have it on the most unimpeachable testimony that alarming symptoms may follow an abdominal contusion without any palpable pathological changes whatever. In a case of this kind would it not be a calamitous step to open the abdomen in search of a phantom—perhaps kill our patient outright through fresh shock or light up a fatal peritonitis?

But laparotomy, serious as it must be viewed in cases of abdominal contusions associated with intestinal rupture which have survived shock and in which its indications are clear, offers the only hope of preserving life, and should be recommended. Let no tyro, however, undertake it. Better a thousand times to leave the case to nature; for this operation to succeed requires special skill and experience, a most thorough preparation of the patient and his surroundings, attention to detail, and intelligent after-treatment.

The latest which has come into my hands on the discussion of abdominal contusions is from the Surgical Society of Nancy. It appears in the form of an essay and a discussion, which are so pertinent and interesting that quite a full transcription from it seems warranted.

Vautrin began by affirming that "neither the violence of a traumatism, nor the shock following the first few hours after injury, nor the appearance of rapidly developing peritonitis, enabled us to diagnose with certainty rupture of the intestine in abdominal contusions." He further added that "when there were indications pointing to intestinal rupture there was no symptom which pointed to the part of the alimentary canal involved." As a rule, peritonitis only made its appearance after an interval of calm, and after primary shock had passed off. He would advise that immediately after injury, when there were reliable indications of intestinal rupture, the abdomen should be opened and an exploration made. For, properly performed, he thought it would not augment the risks; and besides, if any benefit were to follow operation it must be now or not at all.

He had recently observed two cases. One was a man forty years old, a teamster, who had been violently crushed in the right flank. Some hours after injury he was brought to the hospital and seen by Vautrin. Next day general peritonitis was well marked; there was great pain, intense thirst, exhaustion, and faeculent vomiting. In autopsy a rupture of the small intestine was discovered midway between the pylorus and the caecum. Besides, there was a slight laceration of the right lobe of the liver. The peritonaeal cavity was filled with blood and intestinal contents.

The second case was a young man of twenty-three, who fell three metres from a ladder. He was seen the day following injury. There was then ballooning of the abdomen, but no severe pain except at the umbilicus. Slight nausea and retching; pulse, 125 but regular; temperature, 36.5°. The next day he remained about the same, but abdominal meteorism was increased. Laparotomy was proposed, but the fam-

ily refused. The same night alarming symptoms set in and he sank at three in the morning. An autopsy was denied.

From these two unfortunate cases and other observations Vautrin believed that surgical intervention was rather to be preferred than expectation. It was true that a great risk was entailed when one operated under shock, yet he alleged that it offered the injured the only hope.

M. Weiss, in the discussion which followed, declared himself a partisan of early operation when anything like definite indications were present; still he alleged that diagnosis was attended with difficulty. He cited the case of a young woman who had been kicked by a horse, of whom it was at first supposed the intestine was wounded, but who after a few days' rest made a good recovery.

Regnier cited the case of a cannoneer who was accidentally crushed over the abdomen. He saw him twenty-four hours after the injury. At this time the pulse was small, the face pale, and the abdomen flat. Internal haemorrhage was diagnosed. The patient refused operation and died on the third day. On autopsy an extensive laceration of the liver was found.

M. Heydenreich agreed that when we were assured that there was intestinal laceration of considerable extent laparotomy should be resorted to. But we are usually in ignorance of this until it is too late to interfere. Two cases of serious abdominal contusion had come under his care. In one a man of forty years had been kicked by a horse. Peritonitis promptly followed, and he sank on the second day. A post-mortem examination showed an extensive rupture of the small intestine. In another case a man of forty-four years had sustained two kicks from a horse over the abdomen. A fulminant type of peritonitis followed, but after the fourth day it began to decline and he ultimately made a good recovery.

He believed that it should be more generally known that a laparotomy itself is attended with about 25 per cent. mortality under any circumstances. In these cases it greatly

augmented the danger to life, and few survived it. It was temerity to open the abdomen in all, and was not justifiable in any but rare instances.

M. Froelich declared that it all depended on the degree of peritonaeal shock present what course one should pursue. He had seen Professor Goltz, at Strasbourg, instantly kill a large dog by a blow on the abdomen, which left no trace of lesion discernible on post-mortem examination.

M. Gross communicated six observations on contusion of the abdomen, with the following *résumé:*

Case I.—A young man was thrown from a carriage, the wheels passing over the umbilical region. Alarming symptoms on the first day, menaced by peritonitis for four days, when amelioration commenced on the fifth day, and recovery was complete in one month.

Case II.—A youth of seventeen years fell from a loft, striking on the wheel of a carriage. Peritonitis. Death on the fourth day. No autopsy.

Case III.—A man of thirty-two kicked by a horse over the liver. Symptoms of hepatic injury with acute peritonitis. He sank after two months' illness. On autopsy suppuration of the liver was found, with gangrene of the small intestine near the jejunum, and complete obliteration of the superior mesenteric artery.

Case IV.—A man of sixty-two fell on an iron arcade. Subacute peritonitis. Laparotomy twenty-four hours after injury. Blood and faeculent matter in the peritonaeal cavity. Suture of ruptured intestine; closure of the peritonaeum. Death in twelve hours.

Case V.—A young man of eighteen fell and was run over by a carriage. Threatened peritonitis for fifteen hours. Rapid recovery.

Case VI.—A woman of thirty years, knocked down by a runaway and crushed over the abdomen. Menaced by peritonitis for thirty-six hours. Return of symptoms on third day with symptoms of intestinal obstruction. Died on the fourth day. On autopsy intra-peritonaeal hernia with strangulation was found.

M. Gross summarises as follows on these cases: There were four deaths. The great factor which adds to the gravity of complicated abdominal crushes is the visceral complication.

1. Operative medicine judiciously applied must be our main reliance in all severe cases.

2. To derive any benefit from operation it must be instituted early.

3. Unhappily an accurate diagnosis is not always possible. The surgeon must often delay until the time is past for surgical relief.

4. In doubtful cases it is better to delay than venture a laparotomy.[1]

INTRA-PERITONAEAL HAEMORRHAGE.

In cases of sudden exsanguination from intra-peritonaeal haemorrhage from abdominal crushing, should the peritonaeal cavity be opened and its source sought for? On superficial reasoning one might say certainly; why not?

The late Dr. Charles F. Parker and others believed that by opening the peritonaeum and admitting the atmosphere it favoured the arrest of haemorrhage, but this is clearly an error. When we appreciate the fact that great haemorrhage comes from the laceration of a solid viscus or the opening of a large blood trunk, in which case to interfere is to destroy life; that the serous secretion of the peritonaeum is alkaline and favours coagulation of the blood; that the source of haemorrhage is equally but firmly compressed on all sides, the degree of pressure being the greater the larger the escape, then it is more apparent that a laparotomy adds new dangers and interferes with Nature's means of subduing bleeding. The utter futility of attempting to subdue the intra-abdominal haemorrhage when large trunks within the abdomen are opened was recently illustrated in the assassination of M. Carnot, when MM. Ollier and Poucet in vain tried to stem the tide which was springing from the cava, portal vein, and hepatic artery.

Two cases of very large intra-abdominal haemorrhage came under my care last May, one from gunshot and one from a crush. Both were laparotomised. The blood torrent which issued through the incision in both when the peritonaeum was opened was awful and could not be controlled. Both died on

[1] Revue de Chirurg., September, 1894.

the operating table. One, who had a ruptured spleen, might have been saved had he been treated on the expectant plan. Both, I am positive, would have survived much longer had they been left alone. When an opening is made and the blood is allowed to escape outward the loss or waste is irretrievable. But when pure aseptic blood is taken back into the economy there is a great gain. My experience and knowledge gained from a fairly practical acquaintance with these cases convince me that a laparotomy is not to be recommended in any type of haemorrhage succeeding abdominal contusion; that the chances of the patient are much enhanced by local and constitutional measures which do not imperil life.

INJURIES IN THE HYPOGASTRIUM AND INGUINAL REGIONS.

If the wall of the bladder be ruptured in the space of Retzius, the infiltration into the cellular tissues will probably undergo resorption and the rent close of itself. But when the opening is through the fundus and penetrates the peritonaeal coat, the danger of peritonitis is great and a laparotomy may be required to close in the breach.

Sir Wm. McCormick cites sixteen cases of intra-peritonaeal rupture of the bladder from traumatisms. Six were operated on and saved.[1]

Mr. Reginald Harrison says that "when rupture of the bladder has extended into the peritonaeal cavity, I can find no evidence to warrant the belief that life has ever been saved without surgical operation. When life has been saved it has been due to the aid of the surgeon."

But vesical wounds heal with surprising rapidity, and I am not sure but the latter author has rather exaggerated the dangers of temporising. My own practice would be to catheterise with great caution and watch for the onset of serious symptoms before instituting radical measures. The intestines fall snugly over the wall of the bladder; they may quickly become adherent to it and effectually confine the

[1] Encyclop. Surg., vol. vi., p. 327.

urine. The bladder being kept empty, no tension is placed on its wall and union is favoured. Boracic or benzoic acid may be freely given by the mouth for their sedative and healing effects on the vesical mucous membrane.

If, however, there be great and constant pain in the hypogastrium, with marked constitutional irritation and vesical tenesmus, our diagnosis is positive and we may consider the propriety of a laparotomy, but not otherwise.

Guthrie, Pirrie, and other authors allege that atrophic changes often invade the muscles of the abdominal walls after contused violence over any part of them. If these statements can be supported, then it behooves us to endeavour to prevent such changes, or modify their effects by appropriate treatment. In a considerable number of abdominal injuries which have come under my observation, no such sequel has been noted; nor can I find any mention of them in the works of many of the most celebrated authorities.

Kicks or crushes over the inguinal planes, which are devoid of a complete muscular investment, might cause such an extensive rupture of the aponeurotic fibres as would permit the intestine to slip through. It would seem reasonable to believe also that great compressive force over the parietes might so displace the viscera underneath that they would engage in or pass through the canals of emergence.

Aponeurotic fibrous structures are as resistant to force as muscular, and hence are never extensively rent except when the organs invested by them are seriously damaged. We will sometimes have a patient who has an old hernia tell us that it was caused by a blow or fall in early life; at least, that he was not aware of its presence until after this event. In these instances the weight of opinion is that evolution of the hernia was probably but a coincident, or at most that a predisposition existed, and the traumatism was but an aid. There is no direct proof that local contusions over the abdomen will cause hernia. Compression over the abdomen *en masse* certainly will not, as several cases which have come under my care demonstrate; such as result from buffer crushes, those cases

in which heavily loaded vehicles have passed over the abdomen, and those in which the patient in a fall has struck with great force on the abdomen.

But if such injuries cannot be said to directly cause hernia, they certainly do leave the contused over-strained muscles weak, so that when one rises he feels a dragging sensation in the back, the lax abdominal walls permitting of a sagging of the floating viscera and an undue tension of the mesentery which has its anchorage over the bodies of the lumbar vertebrae.

Now, a girth or broad belt will give great support and afford much comfort. It should be worn until tone is restored to the abdominal muscles, till their nutrition is improved and their former functional vigour is regained. Heavy lifting and violent exercise should be avoided for a considerable period, for a structure once seriously damaged on violent use is certain to manifest a diminished resistance.

Case I.—Contusion of abdomen and fractured ribs in a pregnant female. Annie N., aged 40; married; admitted to hospital, June 25, 1891, by ambulance.

Patient was hanging out clothes, holding the line while she leaned far out the window on the fourth story, when the line broke and she fell, striking on the stone flags below. On examination, fracture of the ninth, tenth, and eleventh ribs was discovered, and the right lumbar region was severely contused. She was at this time eight months pregnant. On admission, in great shock, she complained of intense pain over the right kidney. The whole abdomen was exquisitely sensitive. Placental and foetal heart sounds distinct on auscultation. Unable to urinate; some nausea.

Withdrew six ounces of urine, which was densely saturated with blood. There was a large bulging tumefaction just anterior to the right kidney, which was suggestive of extravasation of blood or urine. As soon as she entered the hospital restoratives were administered and a firm binder applied. Great prostration; no paralysis and no cerebral complication.

On second day after admission had fairly reacted. Temperature, 101.5°; pulse, 110; respirations rather shallow.

Remained about the same, passing large quantities of blood with the urine. On the evening of the 28th taken with severe labour pains. At

1 a. m., 29th, delivered, with the aid of the forceps, of a dead male child. Delivery easy and without accident.

Everything went well until the evening of the following day, the 30th, when collapse suddenly set in, and she sank at 7 : 40. A post-mortem examination was denied.

As far as the physical quality of the force went, this case derives its peculiar interest from the physiological condition of the patient at the time the traumatism was sustained. Although physical evidence proved that the infant was not killed outright, it finally succumbed from the great exsanguination which its mother endured through an extensive laceration of the kidney and secondary shock.

Experience teaches us that when labour sets in at advanced term after great bodily injury, the danger to life is great.

From a medico-legal standpoint an important question might arise here, as to whether it could be proved that the death of the child could be traced to the injury when, as in this case, its body bore no evidence of trauma.

There was all the more reason for the question to arise in this case, as the house surgeon saw fit to expedite labour with the forceps. The renal lesion here was well pronounced, for there was evidently a through-and-through rent, inasmuch as blood flowed off in dangerous quantities through the pelvis and out of the urethra. Besides, the extravasate into the retro-peritonaeal tissues was voluminous.

It was my opinion that renal exsanguination led directly to the death of mother and child.

Case II.—Contusion by fall. Patient aged 20; bricklayer; married; admitted to hospital February 26, 1890, by ambulance. Diagnosis: Contusion of abdomen, fracture of right ilium and pubis.

Patient while walking on scaffolding made a misstep and fell four stories, about fifty feet, striking on his abdomen and pelvis, on right side. Immediately sent to hospital. On admission, in great shock, deathly pale; limbs and body deeply cyanotic. Stimulants freely used and heat applied to the extremities. As reaction set in, violent projectile vomiting commenced, but no blood was ejected. As rupture of the bladder was suspected it was distended with ten ounces, but this returned without any blood tinge. The integuments over the hip were deeply

ecchymotic and a linear fracture was discovered running vertically through the ilium, between the anterior superior and inferior spines, besides another through the centre of horizontal ramus of the pubis on right side. The right inguinal region was full and evidently distended by a large intraperitonaeal effusion of blood. The pelvis was firmly fixed by a strong binder and steadied sand-bags. Opium freely given for the first four days. Moderate tympanites and hyperaesthesia of surface. Had to be catheterised for one week. Bowels opened by a clyster on the fifth day. Recovery rapid and returned home March 29, with instructions to continue use of strong binder for the next three months.

The case was one in which the body itself was the moving agent, which, at its impact, as it came in contact with the earth suffered damage over the hypogastrium and the pelvic bones. The skeleton evidently scattered the momentum of impact at the expense of its continuity.

There was no loss of blood beyond that into the iliac fossa nor serious injury of any internal organs.

Case III.—Compressive contusion. Miles J.; driver; married; aged thirty-nine years; admitted December 15, 1889, by ambulance. Diagnosis: Contusion of back and abdomen; traumatic peritonitis. Patient was driving a cart loaded with brownstone three days before admission, when he was thrown forward and one front wheel passed over the abdomen. No great pain was experienced at the time, but two days later it commenced, and he was sent to the hospital. When admitted he was placed in the medical ward, as it was supposed that he had simple traumatic peritonitis. His condition rapidly improved after he had been placed on treatment, and after the second day he was up about the ward, feeling much improved. On the 22d, however, seven days after admission, pain again set in with great severity; rise of temperature, great weakness, and distention of the abdomen making respiration quicker, more laboured, and painful.

On physical examination of the abdomen it was evident that there was a large liquid accumulation, but what its precise character was it was impossible to determine by any special symptom. To determine this, an exploratory needle was passed in over the right flank. On its withdrawal it was evident that the material consisted of bile. Now diagnosis of rupture of the gall-bladder was made, and the case was transferred from the medical to the surgical division for further treatment. At this time his general condition was very bad, and the extent of abdominal distention was so great as to render breathing extremely difficult.

An operation was now undertaken with a view of draining away the

fluid, and, if the patient's condition permitted, endeavour to close the rent in the gall-bladder. An oblique incision was made on the right of the median line along the slope of the floating ribs. Through this 732 ounces of bile-like fluid escaped, or 5¼ gallons. He almost at once went into mortal shock after the peritonaeum was opened, dying on the evening of the 25th, eight hours after operation.

Autopsy.—The following day, general peritonitis, with deep bronzing of all the viscera. A perforation about one line in length was found in the posterior wall of the common bile-duct. It was of a linear form. In the immediate vicinity of the opening there were evidences of previous adhesive inflammation having formed, which subsequently gave way, permitting a leakage into the cavity of the general peritonaeum.

This was a case of compressive contusion and belonged to that type of consecutive rupture of the viscera, which may arise at various periods after the original injury is sustained. Here we note steady improvement for the first week under constitutional medication. Adhesive inflammation had begun to wall off the site of contusion and leakage in the choloduct. But he was imprudently permitted to leave his bed too soon, and in some sudden commotion of the body the adhesions were broken, and the peritonaeum became infected. From the side of diagnosis and treatment the case furnishes us with many important speculations and suggestions. It accentuated the well-known difficulties in diagnosis and prognosis so characteristic of traumatic intraperitonaeal lesions, for in the beginning it was supposed to be so benign a case that recovery was almost a certainty. A laparotomy at an earlier stage after admission of this case could have availed nothing; on the contrary, it no doubt would have been promptly followed by a fatal termination.

In this class of cases we should observe Hilton's dogma of rest of an injured organ, and in all cases of hepatic traumatisms we should endeavour, as far as possible, to diminish the physiological functions of the liver. This can be accomplished by permitting nothing to enter the stomach except small quantities of water, dieting being maintained entirely by the rectum until we are assured that reparative processes are complete.

Case IV.—Contusion by a fall; death of foetus; haemorrhage; peritonitis; laparotomy. Patient twenty-eight years old; married. Diagnosis: Acute traumatic peritonitis. Mrs. M., married six months. Five months prior to accident menstruation ceased. The breasts had become fuller and the abdomen enlarged. Besides she had morning nausea and for some time had noticed swelling of her ankles.

On the afternoon of June 12, 1889, patient, while crossing on some planks over an excavation in the sidewalk, was injured severely by one of the planks rolling over under her feet. She came down with great force on the abdomen. Some workmen near by, who saw her fall, came to her assistance and lifted her out of the trench into which she had fallen.

She was in great pain, but would not have an ambulance called. After resting about an hour and having had some stimulants she walked home, about a quarter of a mile. In the night she had severe abdominal pains and sent for a physician. He ordered sedatives, and the next day, though she could not leave her bed, she felt much relieved. But late in the night violent pain set in, and the abdomen became greatly distended. She continued to grow steadily worse until the fourth day, when she had a flow from the vagina which gave her some relief. The next day was worse than ever, when the physician was changed. He was so alarmed at her condition that he immediately gave an unfavourable prognosis and requested a consultation, when I was invited in.

I found a woman with all the symptoms of advanced acute peritonitis. On examination of the abdomen under chloroform, a large mass was made out to the left of the median line, rather above the iliac fossa. It had a hard, resistant feel. and was altogether too large for a pelvic abscess, besides being out of its radius. On the right side, anterior to the kidney, was another fullness, which, however, was very freely movable, and of such a puzzling conformation that I could scarcely venture a guess as to what it was. Having hurriedly run over in my mind the various lesions here met after traumatism, and remembering that the woman gave a history of pregnancy, it occurred to me that possibly this was a case of ectopic pregnancy. In any event I advised that a section of the abdomen be made at the earliest moment. The next morning with assistance I opened the abdominal cavity. The large mass on the right side was found to be a vast effusion of coagulated blood, at the bottom of which was a placental growth imbedded in the broad ligament. From this a cord extended across the abdomen to the right side under the kidney. Here a five months' foetus was found lying in the free peritonaeal cavity. The placenta was detached and the peritonaeal cavity well irrigated. Recovery ensued, though convalescence was tedious.

The above case was of a unique and extraordinary character. Her large vaginal haemorrhage on the second day after injury, together with the presence of a deciduous membrane, deceived the first medical attendant, as it indicated an abortion. Although at time of operation her condition was most unpropitious, a temperature of 104° and a pulse of 138, she promptly rallied.

In this woman's case it is very probable that, paradoxical as it may seem, an accident which endangered her life led to its preservation. There were no traces of discoloration of integument over the seats of injury.

Case V.—Percussive contusion; rupture of ureter; moderate peritonitis. Patient, male; married; forty-one years old. This case came under my care in the spring of 1886. Patient was a derrick man. While swinging rocks on to a wagon he accidentally got in the way of a large boulder and was violently struck over the right antero-lateral zone of the abdomen, immediately below and to the right of the umbilicus. He was knocked down and for nearly an hour was unable to rise. But after a while, when he had taken freely of hot whiskey, he got up and went home unaided. The next day he was seen by me. Although the entire abdomen was sensitive, the most intense pain was in the right lumbar region. His urine, which was passed with great difficulty, was at first very bloody; constitutional disturbances not marked and no great pain except on movement of the body. He was suffering from moderate traumatic peritonitis and a general bruising of the abdomen. After ten days in bed he made a good recovery except for a swelling which appeared as soon as he took his feet. This was lodged in the right lumbar region. It was about the size of a small cocoanut, fluctuated and was moderately compressible. As there was now no rise of temperature it was evident that it was not an abscess. Its anterior integumental covering was deeply ecchymosed.

An exploratory needle was now passed in, when it was found that the collection was urine. A large aspirating needle, with a vacuum attachment, was then sent in and eleven ounces of urine withdrawn. On the third day following it was again aspirated and nine ounces withdrawn. It but moderately filled again, and in a little while the tumor commenced to diminish in volume and sensitiveness. In a little while it had wholly disappeared. In order to positively determine the nature of the aspirated fluid, a chemical analysis was made of it and it proved to contain nothing but the elements of the normal urine.

This case was remarkable as illustrating how the deeply lodged ureters may suffer severe contusion or laceration while the more superficial organs escape. It besides demonstrated how little constitutional disturbance attends the extravasation of healthy urine when it is uncontaminated and effectively encysted.

Case VI.—Abdominal contusion (compressive). Patient, a boy nine years old; admitted to hospital August 16, 1884. Diagnosis: Abdominal contusion with internal haemorrhage.

Patient climbed on to a vender's coal wagon, heavily loaded, when the horse suddenly started and he fell forward, both wheels passing over the abdomen. Those who saw the accident supposed that the boy was instantly killed. He was unable to rise and groaned from pain in the abdomen.

When brought to the hospital was in great pain and almost pulseless; extremities cool and of a deathly pallour; vomited blood-stained fluid and complained of much pain in the region of the bladder. About one ounce of limpid urine was drawn off, and on test of the bladder it was found that there was no rupture. Moderate doses of opium were given and local applications employed. Reaction slow. The following morning abdomen tympanitic and extremely sensitive; unable to retain anything in the stomach and thirst intense.

On the fourth day after entrance, temperature, which had run high, was nearly normal, the bowels opened, and he passed at stool a large quantity of blackened, partly digested blood. From this time improvement was steady and he left the hospital in good form September 20th.

Haemorrhage is always badly borne in growing children when its quantity is large. In this case the greatest immediate danger arose from this source.

There had evidently been a considerable loss, both within the lumen of the bowel and into the peritonaeal cavity.

It seemed almost inconceivable that a cart carrying more than a ton of coal could pass over this boy's body without doing great destruction to the viscera within. Yet he survived it, and at no time after injury was there any discolouration of the abdominal integument.

A sharp attack of peritonitis followed, but, as is usual with most cases of this malady in non-penetrating abdominal injuries, it pursued a favourable course.

Case VII.—Contusion of the abdomen by percussion. Patient aged twenty-nine; married; housekeeper; admitted July 7, 1893. Diagnosis: Contusion of abdomen with fracture of the tenth and eleventh ribs on right side.

This woman was seriously injured, as a great many are every year in this city, by the breaking of a clothes-line while hanging out clothes through a window at a considerable elevation from the ground. When the line broke which she held, she went out of the window and fell three stories to the ground, striking on her abdomen across a fence.

When she entered hospital was in profound shock, though rational. Muscles of the abdomen tense, and physical evidence of free haemorrhage into peritonaeal cavity.

Abdominal pain extreme and great distress over the liver on any motion of the body. Fracture of tenth and eleventh ribs, but no displacement nor crepitation.

Pulse extremely rapid and feeble. Morphine had to be given in large and frequent doses to alleviate abdominal pain. No blood in the urine, but there was a free discharge of it from the vagina.

Constantly complained of most agonising distress at the umbilicus. Frequently vomiting a greenish, watery fluid with no blood. Reaction had fairly set in the following day; she had all the symptoms of peritonitis. Examination *per vaginam* revealed pelvic cellulitis.

Alimentation entirely by the rectum for the first five days. Abdominal meteorism great and respiration sighing and shallow.

By the sixth day the temperature had reached 104 3-5°; pulse, 134; respiration, 38.

After this date improvement commenced and continued uninterruptedly until her recovery. She left hospital September 26th.

In this case a fearless man might have opened the abdomen for exploratory purposes, but with the shock she was in it would have been indeed a bold step, and even should she survive it, it would have accomplished no good. It would have left a weak abdominal wall with a tendency to ventral hernia, a deplorable condition for a working, child-bearing woman.

Here there was evidently laceration of the liver with every probability of a rupture of the intestine, which was evidently sealed by an agglutinative peritonitis. Her vaginal haemorrhage was of uterine origin, produced by direct injury to this organ.

The tympanitis in this case was so great and prolonged that

had it occurred in the male it would have ended mortally by paralysis of the diaphragm; but in the female, where respiration is chiefly costal, she can endure an enormous abdominal distention with impunity. Besides, there can be no question but that women bear peritonitis and its resulting pain with much greater prospects of recovery than do men.

Opium in large and frequent doses was our sheet-anchor in this case.

Case VIII.—Compressive contusion; the body supine. Patient, Wm. H.; eighteen years of age; single; admitted to hospital April 23, 1891, by ambulance. Diagnosis: Contusion of abdomen; internal haemorrhage; traumatic peritonitis; rupture of bowel.

On the evening of April 23d patient, who was an epileptic, was seized with a fit on Third avenue. In order to try and save himself from falling he rushed into the street and seized the front wheel of a heavily loaded express wagon; was drawn under and run over by it. He was immediately brought into hospital by the ambulance. On admission in great shock, and constantly groaned with pain.

No external evidence of contusion was found. Complained of great pain in abdomen and desire to urinate, but could not.

Catheter evacuated six ounces of very bloody urine. Pulse and respiration rapid and feeble.

Vomiting set in soon after entrance; ejecta bilious but containing no blood.

Hot applications and stimulants, with enough narcotics to subdue pain.

Temperature, 97.2°; pulse, 110; respiration, 26.

April 24. Six a. m., temperature, 97.6°; pulse, 102; respiration, 24. Six p. m., temperature, 97.4°; pulse, 100; respiration, 22.

April 25. Six a. m., temperature, 100.6°; pulse, 116; respiration, 22. Six p. m., temperature, 99.5°; pulse, 120; respiration, 22.

Pulse weak and thready; tympanites well marked; fed freely by enemata of egg-nog and milk-punch. The slightest bodily movement or coughing aggravated his distress; urine still bloody, but less so than on the first day.

April 26. Temperature, 99.8°; pulse, 120; respiration, 28.
April 27. Temperature, 101.6°; pulse, 110; respiration, 28.
April 28. Temperature 104.4°; pulse, 120; respiration, 22.
April 29. Temperature, 101.3°; pulse, 120; respiration, 24.
April 30. Temperature, 102.4°; pulse, 104; respiration, 24.
May 1. Temperature, 99°; pulse, 112; respiration, 24.
May 2. Temperature, 104°; pulse, 120; respiration, 25.

On this date patient was freely sponged with alcohol, and afterward temperature fell to 101.2°.

General peritonitis now well developed.

May 3. Temperature, 102°; pulse, 100; respiration, 26.

Patient began to show signs of lobar pneumonia. A large hot jacket poultice was applied, which extended from the pubes to collar-bone, and frequently renewed.

May 4. Temperature, 102.6°; pulse, 100; respiration, 26.

May 5. Temperature, 102°; pulse, 130; respiration, 40.

Now stimulated and nourished by the mouth.

May 6. Temperature, 102.6°; pulse, 112; respiration, 32.

Patient's general condition was very much improved. Bowels spontaneously opened to-day for the first time; breathing much easier and sleep returning.

May 13. Temperature, 98.6°; pulse, 109; respiration, 27.

May 11. Patient had an epileptic convulsion.

May 14. Temperature, 101½°; pulse, 110; respiration, 20.

May 20. Pulse, 120; poultices discontinued.

May 21. Temperature, 104°; pulse, 110; respiration, 24.

May 22. Temperature, 100°; pulse, 90; respiration, 19.

May 24. Pulse and respiration normal. Patient rapidly convalescing.

May 30. Patient discharged cured.

The above case was attended with several serious complications: (1) the injury to the renal tissues; (2) internal haemorrhage; (3) probable rupture of the intestine; (4) general peritonitis, besides lobar pneumonia, presumably from injury to the lung.

In this case, as with the previous two, the viscera were crushed against the vertebral column. The extent of shock was considerable, and yet, with all the proof we had of serious internal injury of the abdominal and thoracic viscera, there was nothing to indicate it on the abdominal walls. Recovery under these circumstances emphasises what nature will accomplish in this class of cases, and that traumatic peritonitis, even of a very aggravated type, if appropriately treated, will do well without incision or drainage.

Case IX.—Direct contusion and compression; peritonitis; rupture of thoracic duct. Patient thirty-five years old; married; male; admitted to hospital, July 3, 1893. Diagnosis: Abdominal contusion, traumatic peritonitis, and rupture of thoracic duct. Patient, when alighting from

a street-car, was violently struck by the pole of a brewery wagon, was knocked down and run over by the hind wheel. An ambulance was called and was sent to the hospital. Patient in much shock. There was an abrasion over the right iliac crest, anteriorly. Complained of great pain in the lower abdomen; unable to urinate, though had a constant desire to; urine withdrawn and bladder tested for rupture.

On third day temperature had reached 100°; pulse, 86, and respiration, 32; pain not so severe; appetite much improved, but steadily losing strength.

On July 10 a large mass was detected in the right flank, which fluctuated on palpation; flat on percussion. It evidently was lodged behind the peritonaeum and displaced the intestine forward and inward.

It was at first supposed to be a haematoma, but on penetration with hypodermic needle was found to be pure chyle.

On July 15 a free incision was made into the tumor, and a little more than seventeen ounces evacuated of a thin milky fluid. It was of sweetish odour, slightly saline taste, and resembling very much human milk. On chemical and microscopical analysis it was found to be chyle.

For the first three days about eight ounces a day escaped and were secured.

On the 18th and 19th about two ounces escaped each day. From this time its quantity gradually diminished until the 21st, when it ceased. Specific gravity of fluid varied on different days and various hours of the same day, always flowing more plentifully after taking nourishment; general strength improved after lactocele dried up; had painful vesical trouble for some time after, though by October 21 he had recovered sufficiently to return to his home.

The above case was highly interesting from various considerations. The injury was produced by a compound force: (1) the blow of the carriage-pole, and (2) the weight of the loaded beer-wagon. There are reasons to believe that the former struck the hypogastrium with great force, and did damage to the thoracic duct by crushing it against the body of the second lumbar vertebra on which it rests, and that all the viscera, especially the bladder, suffered by the compressing force of the vehicle.

Traumatic lesions of the thoracic duct from concussive violence are exceedingly rare.

In this instance its rupture evidently was secondary to contusion. The escaping fluid made its way through the

retro-peritonaeal tissues, finally gravitating into the iliac fossa. By rest in bed the rent apparently closed, when the salutary effects in nutritive processes were distinctly marked.

Case X.—Compressive contusion; shock; haemorrhage and rupture of intestine. P. K., aged thirty-four; married man; admitted to hospital June 24, 1893. Diagnosis; Contusion of abdomen with internal haemorrhage.

Patient was a middle-sized man, a driver of a cart in the department of street cleaning. On the morning of above date, as he was urging his horse up the "run" to dump his load of street garbage in the scow below, a rival driver collided with his cart, throwing him off, when the wheel of one side rolled over his body as he lay on his back. He was unable to rise unaided.

An ambulance was summoned. When he entered the hospital he was in collapse; some vomiting of blood with great pain at the umbilicus. Warm applications to extremities; internal stimulation and narcotics. Pulse extremely small and rapid; temperature sub-normal.

From the extreme pallour it was supposed that he had a large internal haemorrhage, yet there were wanting the physical signs of it.

June 25. Seemed somewhat better in the morning, but toward noon pain set in again with greater severity than ever, with incessant vomiting; abdomen now ballooned and exquisitely sensitive; collapse deepened. Died at 2:40 p. m.

Autopsy.—Twenty-four hours after death the body was examined. There were two well marked ecchymotic spots visible, one over the anterior superior spine of the ilium on right side, and one farther down, about the middle of Poupart's ligament. On opening the serous cavity a large effusion of blood was discovered between the omental apron and Cooper's fascia.

On dividing the omentum it was seen that there had been a rupture through the jejunum, at about its centre. The opening was about three centimeters in length, and looked as though it had been produced by a direct laceration. Particles of aliment were found, mixed with a large serous effusion. No evidence of serious damage to the adjacent organs.

This was a case which, had its precise character been understood, might have been treated by laparotomy with reasonable hope of success.

It is true that he was in great shock for some hours after admission, and the free haematemesis which he had on admission, greatly exsanguinated him, yet we could scarcely hope for a more desirable case to try it on than this was.

I must confess that when I saw him the morning after injury it seemed to me that the case was by no means without hope. But one of the house

staff ventured to suggest that there might be intestinal rupture. It was then suggested to the patient that a laparotomy might become imperative if worse symptoms should set in. This, however, he would not permit under any circumstances.

The mortal change was as sudden as it was unexpected, but it was entirely in keeping with the alarming rapidity of serious changes so often witnessed after peritonaeal traumatisms.

Ecchymosis in the integument was only visible after death. This is a phenomenon commonly witnessed in bruises over any part of the body. With them we will often see discolouration over seat of injury, only when reparative processes are advanced or when life itself has ceased.

Case XI.—Direct contusion of abdomen; peritonitis and rupture of jejunum. Patient aged twenty-three; single man; admitted to hospital June 23, 1893. Diagnosis: Severe contusion of abdomen. Patient was an operator on what is known as a circular rip-saw in a lumber yard. While feeding the saw, as he pressed a piece of lumber which had a knot in it, it splintered as the blade of the saw struck it, when a large piece rebounded and hit him a blow, as he said, in the pit of the stomach. He was felled by the blow and remained some minutes before consciousness returned. The abdominal pain was very great and he was unable to rise. An ambulance was called and he was brought into the hospital. Was in great shock on entrance.

June 24. Vomited nearly everything he swallowed; considerable thirst, tympanitic abdomen and apparent peritonitis. Morphine freely administered hypodermically. Bowels constipated.

June 25. Is growing steadily weaker and fails to respond to stimulants. Vomiting returned in an uncontrollable form. Collapse set in early in the evening, and he died at midnight.

Autopsy.—The next afternoon the abdomen was opened. The peritonaeal cavity was filled with blood, and fluid of a faecal character. General peritonitis. In about the centre of the jejunum a rupture was discovered, which extended about half way through the intestinal coil; a dark, worm-eaten margin marked the site of perforation. The intestinal lumen for some distance beyond the point of injury was distended with fluid and coagulated blood.

This case was a typical one of injury by percussive or contusive violence. The man was first hit with great force over a limited area, crowding the intestine against the spinal column, severely contusing the intestinal walls, probably splitting the internal tunics so seriously as to devitalise the part and favour speedy gangrene. In this case not the least

visible trace of external violence could be seen, and no rupture of muscle occurred.

The first phase of serious abdominal injury was great shock, probably from contusion of the solar plexus and the heart, by concussion being transmitted through the diaphragm. Secondly, as reaction set in, haemorrhage into the intestine through laceration of its inner coats, and haemorrhage into the cavity of the peritonaeum, through injury to the vessels in the mesentery.

The last and fatal phase was consecutive gangrene of the bowel's wall, faecal escape, and fulminant peritonitis.

Case XII.—Contusion of abdomen by crushing. Patient forty-six years old; married man; admitted to hospital June 17, 1894. Diagnosis: Contusion of abdomen, fracture of pelvis and internal haemorrhage.

This man was injured by being knocked down in the street by horses and then crushed under the hind wheel of a brewer's wagon, which, at the time, was loaded with barrels of beer. The wheel, in some unexplained manner, came between the legs, passing up over the horizontal ramus of the pubes, the iliac fossa and the right lumbar region, the edge grazing the border of the integument over the floating ribs. He was immediately raised and transported to hospital; on admission in mortal collapse, the pulse barely countable and fast failing at the wrist.

He was perfectly rational and said he had no pain, but he knew his end was near and called for a priest.

On a superficial examination it was found that there was an extensive fracture through the pubic ramus and the iliac plate; the lower abdomen was filled with blood, which, in the flank, produced large fluctuating projections; the bladder was empty, and there were no signs of rupture; stimulation was not responded to and he rapidly sank and died, two hours after admission.

In all cases of serious crushes of the lower abdomen, complicated with fracture of the pelvic bones, the resulting lesions are generally mortal. This is because the great blood-trunks, or hollow viscera, are either torn open by the sharp spiculae or edges of the fracture, or else lacerated by the crushing force brought on them, against the sharp bor-

ders of the pelvic brim. The man's death was plainly caused by shock and internal haemorrhage.

An autopsy was denied.

Case XIII.—Contusion of abdomen (percussive). Patient aged 42; single man; admitted May 8, 1894. Diagnosis: Abdominal contusion with rupture of the spleen and internal haemorrhage.

Patient was a sailor, who, on the morning of entrance to hospital, fell into the hold of a ship, striking on his left side over the sharp edge of a cask. He was lifted up in great collapse and sent to the hospital. Six hours after injury he was seen by me. At this time the abdomen was distended by a fluid accumulation and was extremely sensitive over the spleen, where he complained of intense pain. There was no abrasion or discolouration of the integument over the abdomen. The pulse was exceedingly feeble. He was deathly pale, though the extremities were warm.

As this case seemed one in which a laparotomy might be borne with comparative safety, and there were unmistakable evidences of haemorrhage, after consultation with my colleague, Dr. Charles B. White, and with his acquiescence, it was undertaken.

The patient took ether badly, and struggled as he went under anaesthesia. His pulse seemed rather firmer when anaesthesia was complete.

An incision was made to the left of the rectus muscle, in an oblique direction outward and downward for about four inches. On puncturing the peritonaeum, bright red blood spurted through.

Now, hastily extending the incision and passing in the index and middle fingers, the spleen was reached. It was found badly lacerated, one fissure extending vertically upward, nearly cutting it in two. The organ was now carefully drawn into the incision, when its hilum was seized and the artery and vein being ligated separately with strong silk, the spleen was cut away. The peritonaeal cavity was filled with blood. Before this could be removed by sponging, mortal symptoms suddenly set in, breathing became irregular and shallow, and he became pulseless. Time was barely permitted to close the incision with suture when he was dead.

The appalling suddenness of death here was startling in one who but five minutes before was in possession of all his faculties. Every possible care had been taken to provide against shock. The operating room had been well heated, there was no peripheral loss of blood, and the time in operating occupied but a few minutes, as I was ably assisted by Dr.

White and the house staff of five physicians. But the torrent of blood that came through when the peritonaeum was opened, and exposure of the peritonaeum were too much for him.

Perhaps a laparotomy under these circumstances might seem a questionable procedure, yet it was in accordance with sound principles in surgery, for it seemed the only course open to the permanent and definite arrest of haemorrhage. My regrets in this case were that I touched him with a scalpel or forced my unfortunate patient into an ether coma, for it is my conviction that his chances of recovery were quite within the range of possibility if he had been allowed simple rest with an abundance of refrigerant drinks and stimulants. Nature's ways of arresting haemorrhage in the young and healthy are marvellous. Within the peritonaeum the more blood that escapes, the greater is the pressure over the site of the bleeding, mutilated tissue. The blood irritates the endothelial layer of the peritonaeum, and thereby provokes the abdominal muscles into rigid contraction, and hence we have an augmentation of intra-abdominal pressure. But, by opening the abdomen nature's best efforts were thwarted and the only means by which life might have been spared were rudely removed.

Case XIV.—Contusion of abdomen (percussive). Patient, man aged thirty-six; single; admitted to hospital May 23, 1894. Diagnosis: Contusion of abdomen, rupture of intestine, internal haemorrhage and dislocation of right shoulder.

The subject of this history was a hearty, muscular man of about the average height, and weighed about 225 pounds.

In his early boyhood he met with an accident by which he lost his right leg, and as a substitute he wore an artificial member.

About two hours before he was brought to the hospital he started out for a drive with a powerful, but badly broken colt. While driving by a trolley car, the horse was started by the sound of a gong and undertook to run away, but his muscular driver held him in. He then reared, plunged, and tipped the carriage over, but he was manfully held in. He now became furious and commenced to kick violently, striking his unfortunate driver with terrible force, first dislocating his left shoulder, and then sinking his hoof into his abdominal walls. The driver quickly

went down under this battering, and let the reins fall. Succour was promptly at hand and an ambulance soon arrived. I saw him immediately after admission to the hospital. He was then in great distress, complaining mostly of the abdomen. The first thing that was done after he was freely stimulated, was to reduce the dislocation. His abdominal pain was most agonising, and though morphine was administered in very large and repeated doses, and hot stupes were applied over the abdomen, relief was not complete. His state of shock was profound. The skin was marble white, and gave free issue to a cold perspiration. The hands and feet were rather cool. The features were pinched, the eyes sunken and lips bloodless. His urine drawn away with the catheter was normal and bloodless. Over the abdomen there was no trace of injury, neither abrasion nor ecchymosis. But it was everywhere painful, and though both pupils were contracted from full narcosis, still he groaned with pain. Tympanites was well marked, the distension being so great as to interfere with the movement of the diaphragm. As the abdomen was so deeply covered with fat, it was quite impossible to locate any of the organs, or determine any local lesion. With the legs drawn up and the chest raised, he was more comfortable. Treatment was actively instituted for the dual purpose of annulling pain and overcoming the effects of shock, and next with a view of stopping peristalsis and securing quiet to the injured viscera. From the profound anaemia it was evident that some vascular organ had been lacerated and that there was internal haemorrhage. To determine this with any degree of certainty by charging the decubitus and by percussion was impossible, because of his piteous appeals not to disturb his terribly crushed body. Of intestinal rupture there could be scarcely a doubt. The extreme and sudden tympanites quite decided this; besides the agonising, incoercible pain was quite conclusive proof. The pain of intestinal perforation may be distinguished by that quality, as it has been my fortune to verify in laparotomies on the living, and on post-mortem examination on those who have died from such lesions. In two hours this man received two grains of morphine hypodermically, besides nearly a pint of brandy, without wholly subduing the pain. After about three hours it came and went alternately in spasms, probably synchronously with the peristaltic wave, or contraction of the abdominal muscles. His strength gave away rapidly, the pulse steadily weakening and the extremities becoming colder. At 9 p. m. he died, just six hours after entrance. About half an hour before the end came he informed his mother that "the pain was gone and he now hoped to have a sleep."

An autopsy was denied us.

A kick from a horse, delivered squarely and with full force, is often terrible in its consequences. The skull gives way

like an egg shell under it. The thoracic cage, with its pneumatic buffers, inside, will sustain it better than any other part of the trunk. The spine is remarkably resistant, too, for among more than a hundred spinal traumatisms that have come under my care, I have never seen one in which the cord was implicated, which was caused by the kick of a horse. But the abdomen is especially vulnerable to this type of force, and statistics show that many of the mortal types of abdominal contusion succeed such injuries. This man's general condition was so desperate from the time he entered as not to permit us for a moment to consider an exploratory laparotomy. The probabilities are that had we undertaken one, like the previous case, it would have ended mortally before we could return him to his bed. As to the propriety of experimentation in the way of inflating the intestine through the rectum with air or gas, for the purpose of verifying diagnosis, what can be gained by forcing faecal matter through a perforation, into the peritonaeal cavity, or even should there be any reliance placed on the test at all, of what does it avail, when to do the operation is to kill one's patient?

Case XV.—Contusion of abdomen (compressive). Patient, man aged twenty-seven; single; admitted to hospital, June 2, 1894. Diagnosis: Contusion of abdomen, with fracture of floating ribs close to junction with vertebral column.

On the morning of the above date, patient, who was the driver of an ice-wagon, was injured by a collision. He was seated in front, having on a little more than two tons' weight of ice, drawn by two horses, when a heavy team, moving in an opposite direction, collided with the front wheel of the left side of his wagon. The opposing vehicles came together with such suddenness that he was thrown out on the right side, striking the ground on his chest. Before he could extricate himself he was caught and run over by the front wheel, it passing obliquely across the scapula. In the frantic efforts of eye-witnesses to stop the team, the frightened horses, instead of going ahead, suddenly turned, this movement bringing the hind wheel in such a position that it crossed the body just over the iliac and lumbar segment of the spine.

After being doubly crushed by this tremendous weight it was thought that he surely had been killed. He was in such terrible shock that the physician who was first called pronounced the case quite hopeless, as he

breathed only in gasps and was quite pulseless. After two hours' interval he had partly revived, and an ambulance was called, when he was taken to the hospital.

Soon after he entered I saw him. He was yet in great shock, though coherent. He complained of severe pain over the abdomen and over the hypochondriac region of the thorax. He had twice vomited a bloody fluid, and urine drawn away was blood-tinged. The floating ribs on the right side were found fractured close to their vertebral attachment. There was free haemorrhage into the left pleural cavity, and blood spread far into the tissues over the seat of fracture. The abdominal areas were extremely sensitive, particularly over the liver, and free intraperitonaeal haemorrhage was quite unequivocal, probably from a laceration of the liver. The intestine had evidently escaped in this violently flattening-out process. There was a distinct mark of discolouration and abrasion where the front wheel passed, but none over the abdomen. There was no paralysis, but he complained loudly of abdominal pain. Morphine and topical applications had to be vigourously applied. Reaction was gradual and fairly reëstablished when pleurisy and peritonitis set in. Constipation, abdominal distention, and exquisite pain announced the latter, and cessation of respiratory murmur, with acute pleuritic pain and the friction rub, determined the former. Opium, stimulants, frequent enemata, and with the free employment of mercurial inunction over the integument investing the thoracic and abdominal viscera, seemed to sustain him and keep inflammation under control. His youth and fine constitution contributed their share in holding him up until the storm of reactionary disturbances had blown over and function had become reëstablished.

During the second week he was in the hospital his integument became stained by a moderate tinge of bile, the hepatic area was much enlarged, and other associate symptoms pointed to an attack of traumatic hepatitis. His recovery was gradual, but steady, and after the third week he was able to sit up.

July 9. He left the hospital quite recovered.

The features of special interest in the above remarkable case were, first, those referable to the spine. We had here the fact demonstrated that when the lumbar spine is crushed by compressive force, the primary effects of it are manifest first through the abdominal organs which lie loosely anterior to it, which suffer through transmission, the inclosed *corda equina* always escaping except when the force is applied with great impetus and concentration, and when the underlying

organs are mortally damaged. Second, the costal fracture. There can be no doubt but the resilient ribs offered great resistance to the force brought to bear on the back, and so diffused it as to greatly diminish the immediate effect of its impact. Third, the rapid resorption of the intrapleural and peritonaeal haemorrhagic effusions.

Case XVI.—Contusion of abdomen (compressive). Patient aged thirty-two; married; brakeman; admitted to Harlem hospital, January 19, 1894. Diagnosis: Concussion of abdomen; laceration of the liver; rupture of the stomach and urinary bladder.

At about dusk on the evening of above date patient, who was a new hand at railroad work, was assisting in making up a train in the New Haven yards. He stood on one track waiting for a train to move out on another. In the midst of the noise inseparable from moving trains in a freight yard, and while he was watching another train, a car rushed down on the track that he was on, hit him a violent blow on the abdomen, and knocked him outside the rails.

He lay where he fell for nearly an hour, before he was missed, When found he was unable to speak. He was brought into the freight-house, and remedies were vigourously applied by attending physician. After three hours he rallied and was sent to hospital. Was then conscious. He could speak in a feeble whisper and said he was dying.

The hands and feet were that icy damp cold of death. No radial pulse. The sunken eyes, the collapsed nares, and blanched skin clearly indicated that the end was near, and that some large blood-trunks had been torn open. He died a few hours after entrance.

Post mortem examination thirty hours after death. No discolouration of integument. Right rectus abdominalis ruptured through upper third. Peritonaeal cavity full of blood and aliment; the centre of the convex surface of the right lobe of the liver was the seat of a stellate laceration which opened widely the hepatic sinuses. Rupture of the portal vein about half an inch above the confluence of its tributaries.

A rent about four inches long involved the posterior wall of the stomach, extending through all its tunics.

Another laceration was found running transversely across the fundus of the bladder two and one half inches long. No bones were fractured.

This case was one which fully demonstrated the destructive force which so generally attends grave railroad injuries. When a limb is mangled by a railroad smash we almost invariably find the tissues terribly mutilated above and below the

point of injury, the integument often being devitalised far above it. And likewise, in abdominal cases, the extent of destruction is terrible. Two other cases of railroad injuries of the abdomen have come under my observation, but in both the moribund state had set in before the ambulance arrived to take them to the hospital.

Case XVII.—Contusion of the abdomen, resulting in appendicitis: general peritonitis. Boy, aged fourteen; admitted to hospital June 26, 1894. Diagnosis: Traumatic peritonitis following contusion of the abdomen.

Patient stated that ten days before, while standing on the rear of a vender's wagon filling a pail with potatoes, his horse suddenly started and he was thrown out, striking his body with great force against the upper rim of the wheel. He was somewhat dazed for a while, but was able to get up, having a moderate spasmodic pain in the right iliac fossa. He was able to keep at his work for three days; by the fourth the pain became so intense that he was quite unable to rise. Now medical aid was called and moderate purgatives prescribed. For three days he remained in bed without making any improvement. On the tenth day after injury he was sent to Harlem hospital.

On admission was very weak. Moderate vomiting; temperature, 104°; pulse, 118; respiration, 27; abdomen tumefied, exceedingly tender everywhere and suffering constant pain. No marks nor abrasions on abdominal walls. Free inunction of mercury over entire abdominal area; opium given freely; moderate enemata.

The following day much improved; vomiting ceased and thirst greatly diminished. Temperature, 99°; pulse, 94; respiration, 22.

June 28. No pain in abdomen. Sitting up. He was hungry. Temperature, 99°; pulse, 88; respiration, 21.

As he was now apparently convalescent and only needed a few days more of rest, as our service was crowded he was sent to Bellevue hospital.

From the hospital records we learned that shortly after his arrival there serious abdominal symptoms developed. Dr. J. D. Bryant, into whose service he was sent, made incision into the median line and evacuated a large quantity of pus; irrigated, etc. The boy died the next morning. On autopsy the appendix was found perforated and gangrenous.

This was a case, evidently, in which the starting-point of the trouble was in the abdominal contusion, which probably crushed the appendix. It has been a mooted question

whether the traumatism can be regarded as an etiological factor in appendicitis. It is my firm conviction that it is.

This appendage is indeed vermicular not only in contour, but also in its freaks and excursions. It may move down into a hernial sac. It commonly creeps over the pelvic brim, its tip lying in the pelvic cavity. It often turns on itself and finds lodgment under the caecum. Its tip has been found adherent to the liver, and in an abscess which was lately opened to the right of and on a line with the umbilicus it was fixed there.

It may be well designated the ubiquitous organ in the body.

When it hangs suspended over the pelvic brim it is particularly exposed to damage from such compression or contusion as will press it up against this sharp ridge. Possibly it occupied some such position in this case, though autopsy notes do not state.

In the parturient woman it can scarcely escape injury in this situation when the foetal head becomes impacted.

Very recently a case came under my care in which delivery had been attended with great difficulty. From time of confinement she constantly complained of severe pain in her back and right loin. Four weeks after confinement a swelling appeared on the crest of the right ilium. At this time she had well-marked symptoms of local peritonitis with general septic infection. I made a deep dissection over the mass and came down on a cavity filled with gas, faecal matter, and pus. After free drainage a good recovery succeeded.

This was clearly a case of traumatic appendicitis, originating at accouchement.

In the boy we saw well illustrated the insidious manner in which serious consecutive lesions may follow after an apparently insignificant abdominal injury.

Case XVIII.—Abdominal contusion; the body falling. Patient, a man aged forty-four; engineer; admitted July 17, 1894. Diagnosis: Contusion of the abdomen with lacerated kidney.

On the above date, patient fell from the motor-house of a drawbridge to the driveway below, a distance of about twenty feet. In his descent

his right side came with great force against a rail. In connection with the abdominal injury he sustained a Pott's fracture of the right leg. He was immediately transported to the hospital.

On admission he was in shock and suffering great pain in his right side over the lumbar region.

He was seen by me the following morning. At this time he was free from pain unless he attempted to move. On the right side, as far back as the spine, over the four lower ribs, down over the crest of the ilium and for a considerable distance inward there was a large discoloured tumefied area. This imparted a sense of fluctuation, and was everywhere flat on percussion. After he entered he complained of an intense desire to urinate. On the passage of the catheter the bladder was found to be distended with blood, more or less clotted, of a highly red colour, and mixed with urine.

The bladder was irrigated with a warm solution of boracic acid and local dressings applied over the seat of injury.

On the third day after admission he had a chill, after which symptoms of cystitis and a localised peritonitis over the seat of injury and the hypogastrium were well marked. From this time the passage of the catheter was so painful that cocaine solutions had to be employed each time to blunt sensation.

Symptoms of urethral fever gradually set in, sleep was irregular, and he became feverish and fretful. The bowels acted well, and he took freely of fluid nourishment.

After the first week he steadily failed in strength, and symptoms of toxaemia steadily increased. After the end of the third week he drifted into a somnolent condition, in the mean time the urine continuing very bloody. He finally succumbed on the 10th of August, from a mixed condition of exsanguination and urethral fever.

In this case we had an illustration of those urinary sequelae which may follow when the kidney has sustained an extensive laceration or disorganisation from violence, and such constitutional disturbances follow as may imperil life.

It was clearly evident from the physical examination that the kidney had been extensively lacerated, and there was a large sanguinary and urinary leakage into the retro-peritonaeal tissues. The most serious complication, however, came from urethral and vesical irritation, or perhaps what might seem more appropriate—to be *en rapport* with the fashion of the hour—infection.

For some cause not by any means clear to me, in certain cases the most disastrous consequences follow the passage of the catheter into the bladder. To say that it is due to sep-

tic infection proves nothing. My own experience inclines me to dispute this view, for the reason that I have seen it develop when every antiseptic precaution was taken. On the contrary, we see those who catheterise themselves with stiff old instruments as a daily practice for years with impunity as far as infection goes. Haematuria in this case was so excessive and persistent as to produce a most pronounced anaemia, which so exhausted the general system as to reduce its resisting power to the effects of trauma.

Death, in this instance of abdominal contusion, was produced by renal trauma alone. The peritonaeal inflammation remained purely local, and it did not spread beyond the parietal investment anterior to the kidney.

Case XIX.—Abdominal contusion (percussive). H. H., aged thirty; single man; admitted to hospital, August 4, 1894. Diagnosis: Contusion of abdomen, rupture of internal organs, internal haemorrhage and shock.

Patient was employed in excavating rock. On the day of injury he was struck with great force by a falling boulder, which struck him at the umbilicus, and knocked him down.

It was at first supposed that he was killed outright, but he soon recovered consciousness, and the circulation became reëstablished; was immediately brought to the hospital.

On admission the extremities were cold and pulse gone at the wrists; complained of great abdominal pain over the hypogastrium.

Evidence of free internal haemorrhage, with rupture of the liver and deep vessels. No trace of injury over the integument investing the abdomen. No paralysis of extremities, but faeces and urine flowed away involuntarily.

Stimulation and artificial heat made no impression, and he died one hour after admission.

In the foregoing case death ensued from internal haemorrhage, probably either from laceration of the liver or a rent through the vena cava.

Case XX.—Contusion of abdomen (percussive). Patient aged forty-two; married; labourer; admitted to hospital August 12, 1894. Diagnosis: Abdominal contusion with fracture of eighth and ninth ribs.

Patient, a carter, had unharnessed his horses and was about to put them into the stall, when another horse that was passing raised his hind legs suddenly and gave his driver two violent kicks, with both hoofs, knocking him down.

For some minutes he was unable to rise. When he was brought into hospital was in great pain over the chest at the site of injury and at the umbilicus.

The eighth and ninth ribs were fractured near their chondral articulations, and there was evidence of free haemorrhage into the pleural cavity. There were marks of contusion over the broken ribs but none over the abdomen.

Complained of a steady severe pain in the epigastrium. Abdomen everywhere very sensitive. General condition fairly good. The chest was braced by adhesive straps and bandages. With hot aromatic drinks and warm stupes over abdomen, pain was moderated and he rested quietly. This case progressed steadily toward recovery, and he left the hospital quite well after a two weeks' sojourn.

In this case the brunt of force was first received and neutralised by the costal walls of the thorax. The contusion of the abdomen was probably caused by the sudden kick, which, besides bruising the muscles and concussing the viscera, did little harm. The case properly belonged to what might be regarded as a parietal or extrinsic injury of the anterior boundary of the trunk.

Case XXI.—Abdominal contusions (compressive). Patient a driver; twenty-seven years of age; single; admitted to hospital August 27, 1894. Diagnosis: Laceration and contusion of the liver with severe compression of the stomach.

On the morning of this date, immediately after breakfast, a young man having loaded his wagon for market, and his horse being harnessed and standing yet in a covered shed, he went behind the wagon for something, the horse was startled and forcibly backed the wagon against the driver, who could not extricate himself. He was crushed with great force directly across the abdomen above the umbilicus, being caught between the back part of the wagon and the wall of the building. Immediately after backing the animal made a plunge forward, when the injured man fell to the ground in a helpless state. Stimulants were given him and he was sent at once to the Harlem hospital. On entrance he was in great shock; extremities cool and he was almost pulseless. Was promptly placed in bed and restoratives given. Urine was drawn with the catheter. His state was so precarious during the first twenty-four hours that no attempt was made to do anything more than make a superficial examination. By this time no sign of injury could be detected by any discolouration of integument over the abdomen. But he was very sensitive to pressure over the liver and all the superior areas of the abdomen. During the first day in the hospital he suffered from intense abdominal pain and haematemesis. The abdomen was hard and flattened through contraction of the muscles. Physical examination revealed the presence

of fluid in the peritonaeal cavity, which, judging from the sudden and extreme anaemia he suffered from, no doubt was a sanguinous accumulation. Moderate jaundice appeared on the third day, and the urine had a slight and evanescent bile tinge. Constipation persisted for the first six days. Traumatic peritonitis was unequivocal, though it was chiefly parietal and at no time took on serious symptoms. His recovery was gradual, and after six weeks in the hospital left for home fairly restored, still, however, rather weak.

It was interesting to note here that after the fourth day a broad belt of discolouration appeared above the umbilicus and had not quite disappeared when he left the hospital.

This was an instance of typical hepatic traumatism in which the gall-bladder escaped. Though breakfast had been eaten less than half an hour and the stomach was distended with food, it escaped rupture, though from the free vomiting of blood which followed there was no question of extensive laceration of the internal layers. The liver was damaged by being crushed beneath the lower five ribs, being driven back against the spine. The liver, in common with other solid viscera of the abdomen, suffers trauma with singular tolerance, and in the healthy, vigourous subject possesses great recuperative energy. This was well illustrated here.

The development of the line of discolouration on the fourth day was a phenomenon which we commonly witness over those soft parts which are not supported by an osseous understructure of resistance.

Discolouration of the integument depends primarily on effusion of blood from the capillaries, and consecutively on the chemical changes and evolution of gases. These depend on circulation; therefore when reaction does not set in these phenomena are absent.

A FEW REMARKS ON THE TREATMENT OF TYPHOID FEVER.

By J. G. Truax, M. D., of New York County.

October 11, 1894.

"If the bowels have not already been purged by nature or art, it is right to give three or four grains of calomel at once, and to follow this up by a black dose. After that I was formerly in the habit of prescribing, in the early periods of the fever, unless the bowels were irritable, a pill composed of two grains of calomel with two grains of James's powder, every six hours, washing it down with a common saline draught. In hospital practice I frequently omitted the saline draught, allowing the patient to drink toast water or barley water as often as he wished. If there was diarrhoea, or early prostration, I gave, instead of the combination just mentioned, five grains of the hydrag. cum creta. At the same time I carefully investigated the state of the abdomen, and if I found tenderness at the epigastrium, or in the caecal region, in both of which situations tenderness was common, I applied over the tender spot from six to ten leeches, and covered the leech bites with a light poultice. If the diarrhoea ran on profusely I added to the hydrag. cum creta, a certain quantity of Dover's powder or the extract of poppy."

This same author says that he cuts or shaves the hair off close to the head, and that he keeps cold cloths applied to the head as long as they are agreeable to the patient, which is usually for several days.

This method of treatment has been taken from the first American edition of Watson's "Practice of Physic," published by Lea & Blanchard, Philadelphia, 1844. It is the author's treatment for continued fever, or rather a part of his treatment.

The following suggestions are taken from the edition of

Aitken's "Science and Practice of Medicine," edited by Meredith Clymer and published by Lindsay & Blakiston, 1868. "Wunderlich especially advocates the use of calomel, if it can be given before the ninth day. Dr. Parkes is also of opinion that it is extremely useful at this period. The late Dr. Anthony Todd Thomson used to give it; and, from the observation of many cases under the care of this physician, as well as from his own experience, Dr. Parkes considers that calomel is a medicine to be strongly recommended in typhoid fever. But it must not be given later than the tenth day, and at no time in large doses."

"One or two grains twice a day is enough, although Wunderlich gives from one to five grains twice daily; but five grains is considered by Dr. Parkes to be too large a dose."

Dr. Wood, of Philadelphia, bears testimony also to the benefit to be derived from mercury. He believes "it tends in some degree to arrest the progress of the disease in the glands of Peyer, and to promote resolution of the inflamed patches. He prefers minute doses of the blue pill mass—a grain every two hours—till the mouth is slightly affected, associated with small doses of ipecacuanha when the stomach is not irritable. The beneficial effect of this combination is shown by the tongue becoming moist, the skin relaxed, and the symptoms generally becoming ameliorated."

Cold is recommended by this author; cold packing, sponging, and the bath are the methods he favours.

I must try your patience a little longer by quoting from another pre-germicidal author. From an edition of Niemeyer, printed in 1876, we take the following:

"After the accurate observations of Wunderlich, we can scarcely doubt that by this remedy we may in some few cases cut short the disease (according to Wunderlich, one or two five-grain doses of calomel are enough), and that in the great majority of cases when this remedy is given during the first week, and before the occurrence of much diarrhoea, the course of the disease is rendered milder and shorter. The experience of Pfeuffer's clinic, as well as my own, perfectly

agrees with Wunderlich's. We shall not attempt to say whether the calomel has a favourable influence on the typhous intestinal disease, by opposing the sloughing and ulceration, and whether, consequently, we can only expect benefit from it in the first weeks of the disease, when these dangers have not yet taken place."

Willebrand has lately recommended iodine as a specific in typhoid, and the results published by him, Liebermeister, and others, urge us to make more trials with the preparations of iodine in this disease, although the treatment is not a new one. Willebrand dissolves six grains of iodine and twelve of iodide of potassium in a drachm of water, and gives three or four drops of this solution in a wineglass of water every two hours. It is said that, even after one, two, or three days of this treatment, there is a decided remission of the temperature; sordes does not come on the gums, or it disappears early; the fever ceases in an unusually short time. Allow me to say here that I gave this last treatment a fair trial some three or four years ago. It proved to be quite as satisfactory as any one of the other methods so far mentioned in this paper.

In a work on "The Principles and Practice of Medicines," written by the late Charles Hilton Fagge, and published in 1886, we first see the dawning of the true knowledge of the aetiology of typhoid fever. What has been learned since but confirms his views and makes them better understood. Yet when he comes to the treatment of the disease, he does not even allude to a drug which is now known to be a germ destroyer. But he does have a great amount of faith in the use of cold.

I have quoted from the standard works printed during a period of fifty years, from 1840 to 1890. Previous to the first date, typhoid fever, as a distinct disease, was not recognised. Since the last date mentioned its real aetiology has been discovered. Yet during that fifty years such remedies as have since been found to be germicides proved to be of the most use in the successful treatment of typhoid fever.

It need not surprise, then, any of my hearers, if I tell you that mercury, salol, salicin, carbolic acid, and iodine are the only drugs which have been used by the writer for the last two years in the treatment of complicated cases of typhoid fever. These drugs have not constituted the sole treatment. The ice bag has been constantly applied over the right ilio-inguinal region. With a few remarks upon the use of these remedies, and the result of two years' work, I will close this short paper.

Some years ago I treated forty-one cases of typhoid fever, with the cold bath, immersing the patient every time the temperature rose above 104° F., and taking them from the bath when the thermometer registered 102° F. in the rectum. This was an improvement upon any treatment known to the writer up to that time. But it was not entirely satisfactory. It was too much of a shock to weak patients and sometimes it seemed to cause haemorrhage of the bowels. This plan of applying cold was modified by putting the person into a tepid bath and gradually cooling the water to 65° F., unless the temperature declined enough before so low a point was reached. When it was not possible to give the bath the cold pack was used; at times sponging with alcohol and water was substituted for the cold pack.

There can be no question as to the utility of this method of treating typhoid fever. The patients were made more comfortable and the death rate decreased by the water treatment. Still a great many died.

An examination of the Harlem hospital records reveals the following facts: During six years there were treated in its fever ward sixty-five cases of typhoid fever. Such remedies were used internally as seemed to be most popular with the profession, and cold was applied externally in the manner already described. The results were not very gratifying. Of the number mentioned twenty-three terminated fatally,—a little more than thirty-three per cent. It must be borne in mind that many of these cases were practically moribund

when admitted into the hospital. After making all allowance necessary, the death rate was very large.

Under what may be called a new plan of treatment, there has been but one death during the last two years. This one death occurred in the hospital within twelve hours after admission. We have the records of twenty cases of this fever treated in the hospital, with only one death, already alluded to. There have been nine cases treated in private practice, during the same period of time, with no death, making in all twenty-nine cases and only one death.

I am well aware of the fact that as favourable a showing has been made by other methods of treatment, but the cases did not extend over so long a period of time, were not taken from so low a social condition as were many of mine, and consequently were not affected by the change in seasons and in the virulence of the poison.

It is not necessary for me to repeat step by step the treatment pursued. My object in writing this paper has been to impress upon the minds of my hearers two things. One is, that the remedies to be given internally should have the power to destroy the typhoid germs, and should not be those germicides which are easily absorbed in the stomach. The other thing which I am very anxious about your remembering is the ice bag. The writer considers it of more importance than any internal medication in the treatment of typhoid fever. The author's prescription is:

Hydrarg. bi-chloridi	1–200 grains.
Salol	1 1–2 "
Salicin	1 1–2 "

These are thoroughly mixed, made into a triturate tablet or mass, and one taken every hour. When the case is seen early, this treatment is usually preceded by a dose of five grains of calomel.

The ice bag is used in the following manner:

A large, soft, rubber bag is partially filled with small pieces of cracked ice; about enough ice being used to last

two hours. When the tenderness in the right iliac region will admit of it, a greater quantity may be used at a time.

Without wishing to be dogmatic, the writer asserts, feeling that those who give it a trial will have a similar experience, that this method of treating typhoid fever will produce better results than any other now known to the profession. Very much could be said about the diet, but it is taken for granted that nothing is given but milk in this disease. When that can be borne in large quantities nothing else is needed. Just as much should be given as the patient can be made to take. It may be necessary to give it in small quantities and often, two ounces every half hour when the patient is not sleeping. A person treated by this method is quite comfortable during his sickness, his appetite is good, the expression of his countenance bright, emaciation slight, and convalescence rapid. I am not certain that any case has ever been aborted by this treatment, but the duration of the disease has been shortened. Great liberty is to be exercised in the use of or selection of the germicides used, but the ice bag cannot be dispensed with. Much more could be said on this plan of treating typhoid fever, but details to you would be tedious. "A word to the wise is sufficient."

DISCUSSION.

Dr. Charles A. Church, of Essex county, said that he wished to heartily endorse the treatment outlined in the paper. Since 1885 he had treated typhoid fever on antiseptic principles, giving a calomel and soda tablet (half a grain of calomel and two grains of soda) every four hours until the bowels moved, and then following this by intestinal antiseptic drugs. He had more or less complete records of seventy cases treated, with one death. He was careful in his diagnosis, and none of the cases had continued less than fourteen days; at the onset there had been headache, and the peculiar progression of the disease. Many had had also the characteristic eruption. The diet had been milk in as large quantities as the patient would bear. He had preferred to use as an antiseptic a remedy recommended some years ago by a member of this association—the sulpho-carbolate of sodium. In a few cases he had tried salol, but he had not liked it quite as well. At the next opportunity he would try the carbonate of creosote, which would seem to be an ideal remedy from what was known of its action in phthisis.

INTESTINAL ANASTOMOSIS, WITH THE REPORT OF A CASE.

By Frederick Holme Wiggin, M. D., of New York County.

October 11, 1894.

By intestinal anastomosis is meant the restoration of the interrupted continuity of the intestinal canal. This may be effected in diverse ways, many of which have been discarded. In this paper only the modern procedures introduced by Dr. Robert Abbe of New York, Professor H. W. Maunsell, of England, and Professor J. B. Murphy, of Chicago, will be considered. It will not be necessary to describe the gross technique of either, as this has been so thoroughly done by their originators; but an effort will be made to contrast the methods, and to call attention to some details in their technique of which little has so far been said, but which experience has shown to be of importance. In the medical and scientific world, as in the social world, we are apt to go to extremes, and when new methods are announced we hear for a time only of their good points, and as one brilliant result after another is reported at the meetings of societies and in the medical press, we allow ourselves to believe that procedures which formerly required much experience and technical skill, now, by means of these happy discoveries, can be as readily and safely performed by the surgical novice as by the surgeon of experience. Unhappily, we are too often kept in ignorance of the unsuccessful work of our brethren, and it is only by some disaster of our own that we are made aware of some error which might have been avoided had we known that a similar mishap had already befallen some colleague. To be warned of danger is to be able to avoid it. It is by a careful study of the causes of our occasional failures, as well

as of our successes, that present defeat is turned into future victory.

It was soon after the disastrous ending of what might have been a brilliant result that I was invited to come before you at this time, and although it would have been more agreeable to record the successful termination of a case of unusual importance and interest, its narration and analysis may prove of greater instructive value.

On May 31, 1894, I was called to see M. L. C., a married woman aged thirty-four years. Her menstruation began in her sixteenth year, and was of the regular type, without pain. She had had three miscarriages. Fifteen years ago she had an attack of peritonitis. She had been very costive and had had attacks of colic from time to time. She had not been so well as usual during the week preceding the present illness, and for several days had had pain in the right side of her abdomen whenever she had taken a long breath. She had taken several doses of cathartic medicine the day previous and again on the morning of the 31st, but without the desired result. About half an hour before I reached her, and shortly after she had taken her lunch, she was seized with violent colicky pains in the lower abdomen. I found her in collapse, her bodily temperature being 95.5° and her pulse 46. Her abdomen was rigid and the pain was violent and in short paroxysms, and was increased by pressure in the right inguinal region. She was somewhat nauseated. It was supposed to be a case of "appendicitis" with perforation, and her removal to a hospital for the purpose of having a laparotomy performed was advised, but was declined.

A hypodermic injection of a quarter of a grain of morphine with a fiftieth of a grain of nitroglycerin was administered at 4 p. m. At 8 p. m. the patient had ceased vomiting. Her pulse was 100 and her bodily temperature was 98.5°. Her pain had been mitigated. At 10 p. m. she was still comfortable, and her pain was entirely relieved. The diagnosis of appendicitis was considered doubtful. At 2 a. m. she vomited faecal matter, and had severe pain all over the abdomen. At 9 a. m. her pulse was 60, her temperature was 97°, her respirations were 24. Operative measures were once more urged and declined. An enema of eight ounces of a saturated solution of sulphate of magnesium with an ounce of glycerin was administered through a rectal tube. At 11 a. m. a large scybalous movement which completely filled the vessel occurred; the vomiting, however, continued at intervals all day. The pain was general and was no longer localised in the right inguinal region, as it was originally. Late in the afternoon she was persuaded to go to St. Elizabeth's Hospital. At 11 p. m. a consultation was held with Dr. Charles Phelps, her temperature, pulse, and respiration being 97°, 60, and 18 respectively. It was decided that the patient was suffering from intestinal obstruction; that her condition was not at the moment

favourable for operative procedure; that she should be stimulated; and that if she responded the operation should be performed as soon as practicable. It was explained to her that the morphine and stimulants would relieve her pain and make her feel stronger, but that the necessity for operative interference would still exist. A quarter of a grain of morphine with a fortieth of a grain of strychnine was given at 11 p. m., and was repeated at 4 a. m. on June 2. At 5 a. m. her temperature was 99°, her pulse was 100, and her respirations were 24. At 7 a. m., with the assistance of Dr. Charles Phelps and Dr. Parker Syms, the patient was anaesthetised and her abdomen, which was much distended, was opened. As soon as the peritonaeum was incised about two quarts of straw-coloured serum escaped, and the small intestine protruded. The loops of the small intestine were much distended and almost black in colour. They were drawn out, and a point a short distance from the caecum was found to have been compressed by a mesenteric band which had been ruptured as the intestine was withdrawn. The gut showed the mark of pressure. At a point nine inches distant another tight mesenteric band was discovered, which constricted the intestine at that point. This was torn by the fingers. The intestinal circulation seemed to return slowly. At this point the mesentery as well as the intestine was ecchymotic and dark in colour. All present were in doubt as to whether the gut could recover itself or not. Had there been only one or even two feet of this discoloured intestine the patient would have been given the benefit of the doubt by its removal; but as its condition seemed the same up to the duodenum, all that could be done was to return the bowel to the cavity. Before this was done, however, it was deemed advisable to relieve the intestinal distention, and the gut was opened by a longitudinal incision, and the gas and faecal matter were allowed to escape. The wound was then closed by Lembert sutures, and before the gut was returned a moderate quantity of a strong solution of hydrogen dioxide was poured over that portion of the intestine in which the opening had been made. Much heat was given off as this solution decomposed, and it roughened the peritonaeal coat of the intestines before it could be washed off. The peritonaeal cavity was filled with hot saline solution, and the wound closed without drainage.

The time occupied by the operation was forty-five minutes. It was fairly well borne. Stimulants were administered at 9, and again at 10 a. m. At 12 m. the patient's temperature was 98.5°, her pulse was 100, and her respirations were 24. She vomited once, and then but little. During the afternoon nutritive enemata were given. At 9 p. m. her temperature, pulse, and respirations were 100.5°, 100, and 24 respectively. The patient was free from pain and nausea; she urinated freely and slept during the afternoon.

June 3. At 4 a. m. by mistake the sister gave a cathartic. At 6 a. m. her temperature was 100°, her pulse was 100, her respirations were 24. At 8 a. m. she vomited a little. At 10 and 11 a. m., 12 m., and 1 p. m., powders containing each one tenth of a grain of calomel, with one grain of bicarbonate of sodium, were given. At 4 p. m. a large movement

resulted. At 7 p. m. her temperature was 98.5°, her pulse was 80, her respirations 18. The patient retained nourishment, and slept much during the day and passed a comfortable night.

June 4. The patient had a large stool at 5:30 a. m. At 9 a. m. her temperature was 98.5°, her pulse was 80, and her respirations were 24. At 5 p. m. they were 99°, 72, and 18 respectively.

June 5. The patient had remained comfortable and her temperature was normal, and remained so till the 8th of June, when there was a slight rise. The abdominal wound was examined, and it looked a little red. The sutures were removed and were found to be clean.

On June 10, the eighth day following the operation, the superficial part of the wound was opened, and an ounce or two of foetid pus escaped, which had a strong faecal odour. This superficial cavity was syringed out with the strong solution of hydrogen dioxide. On the 11th of June there was no faecal odour, and the discharge from the abscess was slight. Her temperature became normal again, and remained so till the 21st of June. She now sat up, but complained of pain on passing urine, of some backache, and of a yellowish discharge which escaped from her vagina. Her temperature now ranged from 99° to 102°, and her pulse from 92 to 102. This seemed to be satisfactorily accounted for by the patient's statement that she was subject to malarial chills, and that the time for her menstrual period was at hand. On the 23d she sat up, and complained that this caused pain in the uterine region. She now began to flow, and her temperature subsided. Her bowels moved daily. The sinus in the anterior wall remained patent, but discharged little pus. On the 26th another rise of temperature occurred, and from this time until July 7 it varied from 99° to 102°, and her pulse from 99 to 104. The flow having ceased, an examination *per vaginam* was made, and a large mass was discovered on the right side and behind the uterus. Pressure on the mass caused some blood and pus to flow into the vagina from the uterus, which was fixed and tender. A consultation was held, and an operation advised and consented to. It was performed on July 7, thirty-five days after the first operation. Prior to the operation her temperature was 100°, her pulse was 98, and her respirations 20.

An incision was made on either side of the old cicatrix, and the sinus was cut out. The tissues were matted together. The peritonaeum was opened with care, and the intestines were found adherent to the anterior abdominal wall. These adhesions were broken up and the wound enlarged with the scissors, the forefinger of the left hand being used as a director. As this was done there came into view a knuckle of ileum which was divided transversely and symmetrically almost from one mesenteric border to the other. There was no faecal matter in this portion of the intestinal canal. Nine inches from the first solution of continuity a second was discovered, which resembled the first in every particular. The edges did not have the appearance of having been recently cut, and it did not seem possible that they had been cut accidentally in the course of the operation. The points of division corresponded to the

points at which the ileum was found constricted by mesenteric bands at the primary operation. The patient being feeble, it was deemed wise to make the operation of as short duration as possible, and the bowels were anastomosed at both points by Murphy buttons. Unfortunately, only one medium-sized button was available, and the second point being near the caecum was joined by one of the larger size. Its segments were introduced with some difficulty on account of its size. A strong solution of hydrogen dioxide was poured over the intestines at this point. Its decomposition was effected with much rise of temperature, and saline solution was poured over them promptly, but not soon enough to prevent roughening of the serous membrane. The weaker solution does not do this. Many of the intestinal adhesions were now broken up, the bowels were returned to the peritonaeal cavity, and a search was made for the abscess. One was found in the right broad ligament involving the right tube. This mass was removed, but in doing so the sac was broken, and much pus escaped into the pelvic cavity. This was sponged out, and hydrogen dioxide was poured into the cavity; as the patient's strength was failing, some adhesions posterior to the uterus were left undisturbed. The cavity was irrigated with hot sterilised saline solution and the abdominal wound was closed. The duration of the operation was two hours. The amount of ether used was six ounces. Stimulants were administered, and the patient rallied. At 4 p. m. her temperature was 101° and her pulse was 120.

July 8. The patient passed a good night, nutritive enemata with stimulants being administered. She passed a fair amount of urine.

There was nothing of interest to record till the 9th of July, at 3 a. m., when the patient vomited faecal matter freely. Her temperature was 102°, her pulse was 120, and her respirations were 24. At 6 a. m. she complained of a sharp pain in her left lumbar region. At 11 a. m. her temperature had risen to 104°, her pulse was 120, and her respirations were 20. The vomiting continued at intervals during the day. A consultation was held, but it was decided not to interfere further, and the patient died at 3 a. m., July 10, twenty-four hours from the time faecal vomiting had begun, and sixty-four hours after the operation.

July 10. *Necropsy.*—The abdominal wound had united primarily. On opening the peritonaeal cavity it was found to contain about three ounces of blood-stained fluid. The bowels were somewhat distended, and on the left side, just below the site of pain complained of by the patient, they were adherent to the anterior abdominal wall. Breaking these up, a small perforation was found posterior to the larger button. The lines of union over both buttons were perfect. The intestine here was flexed and adherent, giving rise to the fatal obstruction. At the site of the abscess partially excised at the previous operation there was no sign of infection, but an abscess was found posterior to the uterus under the adhesions that were not broken up previously.

The points of interest in this case are:

1. The severity and sudden onset of the symptoms.

2. The prompt reaction brought about by the use of morphine and strychnine as stimulants.

3. The early onset of faecal vomiting—eleven hours after the beginning of the attack.

4. The large alvine dejection following the administration of the enema, other symptoms of obstruction meanwhile continuing.

5. The large amount of fluid in the abdominal cavity found at the primary operation.

6. The strangulation of the intestine by two mesenteric bands a few inches apart.

7. The recovery of the intestines, except at the points of constriction, after thirty-six hours of strangulation and their having become dark and dull in colour, the ecchymosis extending into the mesentery.

8. The faecal movement thirty-six hours after the primary operation, followed by the immediate fall of the patient's temperature to normal and remaining so for five days.

9. The abscess of the anterior wall, giving when opened a faecal odor, and none thereafter.

10. The possible independent pyosalpinx (?), the pelvic abscess having no communication with the abcess and sinus in the anterior wall.

11. The adherence of the intestines to the anterior wall, and the mass of adhesions found at the second operation.

12. The bowels symmetrically divided at the former points of constriction.

13. The double anastomosis by Murphy buttons.

14. The perforation posterior to the larger button and the complete closure of this by adhesions.

15. The flexure of the intestine, causing fatal obstruction.

16. The site of the pelvic abscess, which was partly removed at the second operation and disinfected with hydrogen dioxide, and had remained clean sixty hours after the completion of the operation.

Remarks.—In the early diagnosis the writer was misled by the fact that at first no history of previous peritonitis or

injury could be drawn out—the attack had occurred fifteen years previously and the patient had forgotten it; also by the absence of vomiting, which is, as a rule, a constant, continuous, and early symptom; also by the presence of right lumbar tenderness and pain, which is usually absent. The mode of onset of this case, with the history of previous peritonitis, of chronic costiveness, of recurrent attacks of colic from time to time, and the sudden seizure after the use of powerful cathartics, was the story of strangulation by bands, which causes, according to Treves, twenty-five per cent. of all cases of intestinal obstruction. Opium and strychnine are indeed valuable agents with which to overcome shock, as they proved to be in this case; but care must be taken in their use. The diagnosis should first be fairly considered, and, if clear, the necessity for operative measures should be explained to the patient, and the statement made that the medicine employed will have no curative effect, but will only relieve the symptoms and put the patient in a proper condition to bear what is to follow. Till this is done, the use of opium is dangerous to patient and physician alike. The character of the pain is important. At first it was intermittent, which meant that the obstruction was complete; but this was indicated later when it became continuous and faecal vomiting occurred. This seldom appears before the fifth day. The large stool following the enema while the ileum was tightly compressed by bands shows how unreliable is this symptom. In this case only the patient was misled, as the other symptoms continued with unabated severity. Had morphine been administered during this time and the patient made comfortable, her consent to removal to the hospital with a view to operative measures would never have been given. Cruel as it seemed to allow the patient to bear severe pain for hours, it was at that time the best service that could be rendered her.

The large amount of fluid found in the abdominal cavity at the first operation, and the absence of intestinal agglutination with general peritonitis, would tend to confirm the writer's

theory that it may be possible to limit or prevent the formation of adhesions by filling and closing the abdominal cavity with the sterilised saline solution—0.6 per cent. The adherence of the intestine to the anterior wall, and the mass of adhesions found at the second operation, notwithstanding the use of the saline solution to prevent them, is of interest. The writer's theory is, that they formed after the solution was absorbed, on account of the perforations for the purpose of protection.

In August of this year, at the Carnegie Laboratory, with the assistance of Dr. Titterington, twenty experimental operations on dogs were undertaken, and it was found that twelve ounces of the saline solution could be safely introduced into the peritonaeal cavity of a dog weighing from fifteen to twenty pounds; that it was absorbed in from twenty to thirty hours; and that in no case where it was used were there intestinal adhesions, notwithstanding the fact that some portions of the intestines were in most cases drawn out and sponged with a 1-to-1,000 bichloride solution, or a 1-to-20 carbolic acid solution. In one case they were scraped and the serous coat incised at several points, except in those cases where there was some intestinal complication, such as a failure of a suture, or perforation from one cause or another.

It is not the writer's purpose in this paper to attempt to detract from the brilliancy of Prof. J. B. Murphy's invention, or to doubt its utility, but to show, if possible, that it should be used by experienced surgeons with a proper understanding of its dangers, which are numerous. It is, in the writer's opinion, somewhat unsurgical,—(1) Because it places in the intestines a foreign body which is occasionally therein retained, and renders necessary a secondary laparotomy for its removal. This happened in an unreported case treated by a well-known surgeon of this city. (2) Because it makes the patient dependent on the craft of the cutler rather than upon the skill of the surgeon, the spring of the button being made at times too strong, and at other times too weak. In an experimental anastomosis in a dog, the spring was so pow-

erful as to cut through all the coats of the bowel and to project into the peritonaeal cavity, causing death in fifteen hours. In another case the animal died within forty hours from the same cause. There do not seem to be indications by which it can be known when the instrument is properly constructed. (3) Because there is the trouble of being obliged to have a button or buttons of the proper size, as, in the case reported, a perforation following the use of a button a little too large for the portion of intestine united. This accident also happened in the practice of the surgeon previously alluded to. (4) Because there is danger in the weight of the button, which may act as an anchor to hold the bowel in a flexed position, thus causing obstruction, as happened in the case just narrated. (5) Because there is some danger of the lumen of the button becoming plugged with hard faecal matter, causing thereby a fatal obstruction, as happened in an unreported case of the surgeon already alluded to. (6) Because there is danger in the holes placed at the ends of the buttons for the purpose of drainage causing a perforation, the intestine being pressed into them and against their edges if care be not used in pressing the segments together. To prevent this accident, a sponge should be placed behind each segment of the button before these segments are pressed together. This accident happened in the course of the experimental work previously alluded to, all the coats from the mucous to the serous, but not including it, being divided.

Experiment proved that there was no practical difficulty in the way, at least in the dog, of uniting the intestine by means of the button at two points nine or ten inches apart, if need be, as in this case; or in case of a gunshot wound, or a stab wound, as the following report shows:

On August 24, a dog weighing twenty-five pounds was anaesthetised, his peritonaeal cavity was opened, and a portion of the ileum was drawn out and cut across, and the ends were united by means of a Murphy button. A second point, nine or ten inches distant, was also incised and joined in the same manner. No chemical solutions were used except the sterilised saline solution with which the intestines were washed, and an

ounce of hydrogen dioxide. No fluid was introduced into the peritonaeal cavity. The external wound was closed. On August 25 the dog seemed well and bright, showed no evidence of pain, and defecated. On August 27 the dog continued well, defecated, and took milk and bread in large quantities. On August 31 the dog appeared to be in good health. Both buttons had passed during the night. The animal continued well up to October 6, when he was killed and the peritonaeal cavity was opened. The omentum was found slightly adherent to the line of incision; there were no intestinal adhesions except at the points of anastomosis; the lines of union were barely visible, and there seemed to be no contraction. Forty-three days had elapsed since the operation had been performed.

The method of intestinal anastomosis devised and described by Prof. H. Widenham Maunsell,[1] if not so alluring as that of Professor Murphy, has, to the writer's mind, many advantages over the latter. If the union cannot be as quickly effected, it requires for its performance no mechanical device —only a few needles, silk or horsehair for sutures, and experience and general surgical skill. That the method is not as frequently employed as it deserves to be is due to its having been introduced about the same time as the Murphy method, which, from its apparent safety, ease, and lack of special skill required for its accomplishment, has temporarily captivated the medical mind. In time it will be determined which is the better method. The writer believes that in the future the Maunsell method will at least be more frequently employed, if it does not eventually displace the other.

So far the writer can find records of only three operations by the Maunsell method—one was reported by Professor Maunsell[2]. The operation was performed in December of 1886, and was for intestinal obstruction due to a carcinoma. Four inches of the ileum were excised, and the ends united according to Maunsell's method. The time occupied was thirty minutes. The patient died on the sixth day, from exhaustion. The necropsy revealed union of segments of the bowel. There was no sign of leakage.

Dr. Frank Hartley, of this city, reported a case of double

[1] The American Journal of the Medical Sciences, March, 1892.
[2] London Lancet, February 13, 1892.

intussusception and carcinoma, with excision of both; end-to-end union by Maunsell's method; time of operation thirty minutes. The patient made a good recovery, her bodily temperature not reaching 100° F.[1] Up to the present time (1894) the patient has remained well. He remarks: "To me it seems to be *the* method for enterectomy. The rapidity with which it can be done, and the easy command one has over the haemorrhage, seem to be the two great points in its favour."

On September 12, 1893, the writer excised six inches of the ileum for contusion and perforation, and joined the ends according to Maunsell's method.[2] The patient made a good recovery, and had remained well and without bowel trouble when last heard from in July of this year, ten months after the operation. The urgency of this case was great. The patient was in a country farmhouse. The operation could not safely have been delayed one hour longer than it was; consequently there was no time to procure mechanical devices from the city. A few instruments, a paper of ordinary sewing needles —milliners' No. 6—and some iron-dyed silk were easily procured, and the operation was promptly performed, and the patient's life was saved.

In this operation there are also some points in which danger lurks, but which with a little practice are easily overcome:

1. Care must be used in approximating the mesenteric border, otherwise sloughing may occur at this point.

2. The sutures should be interrupted, and must not be placed too near the edge of the intestine; they should be placed a quarter of an inch from it at least.

3. The sutures should not be drawn too tightly.

4. Care must be exercised in reducing the invagination, after the sutures have been placed, not to use much force, or the sutures may cut out.

5. Care must also be exercised in closing the longitudinal

[1] New York Medical Journal, vol. lvi, pp. 302 and 464.
[2] New York Medical Journal, January 20, 1894.

incision not to turn in too much of the edges or it may cause a contraction.

The difficulties to be overcome are those which skill and experience can control. Dr. B. Merrill Ricketts, of Cincinnati, in reporting a case of anastomosis by the Murphy button,[1] said: "I am satisfied that the Murphy button was the most appropriate in this case, although I am thoroughly convinced that the Maunsell operation is the one to be used in the majority of cases."

In conclusion, the writer can but believe that the best surgery is that which requires the fewest mechanical devices and the fewest special instruments for the accomplishment of its purpose, other things being equal; and the writer's own experience would at this time lead him to believe that Dr. Ricketts is right in saying that the Maunsell operation is the one to use in the majority of cases, and that as time passes it will be better appreciated, as it deserves to be. At present there have been only three cases placed on record, and, as far as the anastomosis was concerned, all were successful. They are too few to build on, but they point the way to a thoroughly surgical, quick, and easy method of intestinal anastomosis, adaptable to any portion of the canal—a method which is perfectly safe in the hands of those who have the proper experience and technical skill. If for any reason a lateral anastomosis is desired, what can be better than the method devised and advocated by Dr. Robert Abbe?[2] This, like the Maunsell method, requires no mechanical aid for its execution, and both are exquisite surgical devices.

Through the courtesy of Professor J. B. Murphy, which is hereby acknowledged, and of some other gentlemen, the writer has been able to collect twenty-three cases of intestinal resection in which end-to-end anastomosis has been effected by the button. Some of these cases have not yet been reported. Of these patients, eighteen recovered and five died, giving a mortality of 21.7 per cent. and 78.3 per cent. of re-

[1] The Annals of Surgery, vol. xix, p. 473.
[2] Medical Record, April 2, 1892.

coveries. If we add to these twenty-three cases thirty-three others previously collected by Professor Murphy,[1] in which thirty-two patients recovered and one died, we get a better result—a mortality of 6.9 per cent. and 93.1 per cent. of recoveries. But it must be borne in mind that in all probability many unsuccessful cases have not yet been placed on record. There were also collected eleven cases of gastro-enterostomy, in which seven patients recovered and four died; mortality, 36.3 per cent., and recoveries, 63.7 per cent.; eleven cases of cholecystduodenostomy for cholelithiasis, in which ten patients recovered and one died—mortality, 9.1 per cent., recoveries, 90.9 per cent.; five cases of cholocystenterostomy for malignant disease, in which two patients died and three recovered—mortality, 40 per cent., and recoveries, 60 per cent.; and one case of lateral anastomosis, in which the patient recovered.

If now we add all of the cases, we get a grand total of eighty-four, of which seventy-one recovered and thirteen died —a mortality of 14 per cent. and recoveries, 86 per cent. Of the deaths, two were due to haemorrhage, six to shock, two to intestinal obstruction, two to failure of the button, due to a wrong-sized button being used, and one to continued peritonitis. Ramon von Baracz[2] gives the mortality of intestinal anastomosis at 24.5 per cent.

Professor Murphy's Consideration of the Objections raised by Dr. Wiggin to the Button.—The following was received from Dr. Murphy too late to be read at the meeting:

The statement that the button is a foreign body in the intestinal tract, and may be retained, thereby rendering a secondary operation necessary for its removal, is true and it has occurred; but let us ask some questions as to the case to which, I believe, the doctor refers, and some of the particulars of which I have learned indirectly: Why was the button retained, where was it retained, what was the nature of the case, and in how many cases has it occurred? Further, what danger is there, when the case is properly managed, should it occur? In cases of intestinal fistula in which lateral approximation is performed, where a large portion of

[1] Published in the Chicago Clinical Review in June, 1894.
[2] Deutsche Medizinal-Zeitung, Berlin, May 25, 1893.

the faeces escapes through the fistula, where is the current of the faeces? Through the proximal end out of the fistula. The button would therefore naturally fall into the proximal end, and present itself with the faeces at the fistula. If the fistula be closed at the time of the primary operation, the button will be forced with the contents of the intestinal tract on into the distal end to the rectum. If, on the other hand, the fistula be closed after the button presents itself at the opening of the fistula the contraction of the portion of the bowel which is rendered useless by anastomosis will force the button to the opening, and it will pass on with the contents. The button may be removed through the fistulous opening with proper and careful dilatation of the fistula, an operation which no surgeon would consider of grave importance. Again, it has been retained by a fibrous band in the hepatic flexure of the colon; it produced no symptoms of obstruction, but was found there post mortem. Another case in which it was retained was one of secondary carcinomatous growth of the sigmoid flexure, where anastomosis had been performed higher up; here also there were no symptoms of obstruction. There has not been reported to me, in the one hundred and thirty-six cases recorded as already operated with the button, a single case in which the symptoms of obstruction were produced by retention of the button, and only two reported in which the button was retained, also one of which I have heard indirectly. This would, therefore, appear to me to be a very small objection, and I can not consent to this objection being of sufficient importance to designate the instrument unsurgical.

The second objection, that we depend on the craft of the cutler rather than on the skill of the surgeon, is not well taken. We might as well argue that we depend on the silk manufacturer for the silk used; we do, but the cautious surgeon tests his silk; he should also test his button. I have volunteered to examine the buttons for all the manufacturers. I have sent models to all manufacturers who have requested them, and would gladly inspect, and do inspect, all buttons sent to me for that purpose. I have found a number of reliable instrument houses making perfect buttons. With this advantage, there is no conscientious surgeon justified in using a button unless he knows that it has been inspected or has been manufactured by some reliable house. There are defective buttons on the market; this I am powerless to avoid, as our ethics prevented me from procuring a patent on the button, thereby controlling its manufacture. I certainly do not believe that the fact that defective buttons have been manufactured is a valid argument against the utility of the device. I congratulate the doctor on the result obtained in his experiment of double anastomosis in one sitting. He is the first to use the button in that way, and I see no objection to its use.

NEW YORK, December 4, 1894.

To the Editor of the New York Medical Journal:

SIR: In connection with my paper on "Intestinal Anastomosis," published in your journal of December 1, there appeared a critical examination by Professor Murphy of the objections that I made to his button. Permit me to reply that Professor Murphy's remarks as to the retention of the button in cases of intestinal fistulae do not apply to the particular case mentioned in my paper, as there was no fistula, and that the second operation terminated fatally was ample proof that there was danger.

The doctor's answer to the second point adds force to the objection and proves it to have been well taken, as it is obviously impracticable to submit all buttons for Dr. Murphy's inspection and approval.

The other objections made seem to be conceded by the inventor, as he has made no effort to answer them.

In collecting the cases of Maunsell's method of intestinal anastomosis, it is regretted that a case reported by Dr. Parker Syms in the course of the discussion on the writer's case of "Contusion and Rupture of the Ileum" (*New York Medical Journal*, December 9, 1893, page 702) was overlooked.

FREDERICK HOLME WIGGIN, M. D.

CHOLECYSTODUODENOSTOMY FOR CHOLELITHIASIS.

No.	Date.	Publication.	Operator.	Diagnosis.	Operation.	Method.	Position.	Result. R.	Result. D.	Cause of death.	Remarks.
1	Apr. 17, 1894.	*Buf. Med. and Surg. Jour.*, July, 1894.	Mynter.	Cholelithiasis; enlarged gall bladd'r.	Cholecystoduodenostomy.	Murphy button.	S. to s.	1	....	.....	Rapid recovery; button passed 22d day; 126 gall-stones.
2	Mar, 1894.	Not published.	Bradley, Peoria, Ill.	Obstruction of common duct.	"	"	"	....	1	Exhaustion, 7th day.	Post mortem; profuse hæmorrhage from liver where it had been torn during operation in freeing adhesions; approximation perfect. Time for operation, 40 minutes.
3	May, 1894.	" "	Bradley, Peoria, Ill.	Cholelithiasis; dilatation of gall bladder.	"	"	"	1	....	.....	One hundred and fifty calculi; button passed 40 days after operation.
4	Oct. 16, 1893.	" "	A. H. Ferguson.	Gall-stones.	"	"	"	1	....	.....	Excellent recovery.
5	Feb. 22, 1894.	" "	A. H. Ferguson.	Gall-stones.	"	"	"	1	....	.....	Excellent recovery.
6	Mar. 25, 1894.	" "	A. H. Ferguson.	Gall-stones.	"	"	"	1	....	.....	Excellent recovery.
7	May 16, 1894.	" "	Clayton Parkhill.	Gall-stones.	"	"	"	1	....	.....	Button passed 22d day; convalescence uneventful.
8	July 16, 1894.	" "	G. G. Burdick.	Cholelithiasis, obstructive.	"	"	"	1	....	.....	Button passed 14th day; large calculus allowed to remain in choledochus.
9	Sept. 8, 1894.	" "	J. B. Murphy.	Cholelithiasis; obstruction of cysticus.	"	"	"	1	....	.....	Time for operation, 20 minutes. Difficulty experienced in pressing large calculus from cystic duct back into gall bladder; 6 calculi removed.
10	Aug. 17, 1894.	" "	W. D. Middleton.	Cholelithiasis; obstruction of choledochus.	"	"	"	1	....	.....	Gall bladder found contracted to size of hickory nut, stone half that size removed; obstruction due to fibroid degeneration along entire length of duct; smallest sized button used.
11	Sept. 15, 1894.	" "	J. B. Murphy.	Cholelithiasis; obstruction of cystic duct.	"	"	"	1	....	.....	Gall-stone as large as filbert impacted in cystic duct; removed through gall bladder, which was much dilated, full of mucus, no bile. Time for making anastomosis and removing calculus, 6 minutes; time for making entire operation, 16 minutes.

No.	Date.	Publication.	Operator.	Diagnosis.	Operation.	Method.	Position.	Result. R.	Result. D.	Cause of death.	Remarks.
1	March, 1894.	*Buf. Med. and Surg. Jour.*, July, 1894.	H. Mynter.	Stenosis of common duct.	Cholecystduodenostomy.	Murphy button.	S. to s.	....	1	Prostration.	No peritonitis; perfect adhesions; multiple carcinoma of pancreas and liver.
2	Feb. 2, 1894.	Not published.	Ernest W. King.	Carcinoma of pancreas.	"	"	.....	....	1	4th day.	No peritonitis; cholæmic hæmorrhage from all mucous surfaces of the body.
3	Sep. 29, 1894.	" "	F. Hartley.	Stenosis of common duct.	Cholecystocolostomy.	"	S. to s.	1	....	.....	Patient's temperature normal; button passed on the 15th day.
4	Feb. 20, 1894.	" "	Robert Abbe.	Chronic obstruction.	Cholecystoenterostomy.	"	"	1	....	.....	Good recovery; button passed on 12th day, and patient has remained well; cholecystotomy 4 months previously.
5	Sep. 17, 1894.	" "	H. M. Silver.	Stenosis of cystic duct.	Cholecystoenterostomy.	"	"	1	....	.....	Button not passed up to the 35th day, unless it escaped observation.

RESECTION, END-TO-END ANASTOMOSIS.

No.	Date.	Publication.	Operator.	Diagnosis.	Operation.	Method.	Position.	Result. R.	Result. D.	Cause of death.	Remarks.
1	June 13, 1894.	Not published.	Themones.	Strangulated hernia.	Resection, end to end.	Murphy button.	E. to e.	1	....	.....	Button passed 18th day.
2	June 21, 1894.	" "	Cochems, F. W.	Strangulated hernia.	"	"	"	1	...	.....	Resection of 26 inches; button passed 180 hours after operation.
3	June 15, 1894.	" "	McCallum, J. L.	Strangulation of ileum.	"	"	"	1	....	.....	Twelve inches of ileum resected.
4	April 2, 1894.	" "	Dr. Newton.	Neoplasm of mesentery.	"	"	"	1	....	.....	Button passed 14th day. (Small child.)
5	April 7, 1894.	*N.Y. Med. Jour.*, September, 1894.	Dr. Dennis.	Strangulated hernia.	Resection of ileum.	"	"	1	....	.....	Button passed 22 days after operation; wound suppurated; fæcal fistula closed on 27th day.
6	May 12, 1894.	Not published.	Meyer, Willy.	Intussusception; myxosarcoma.	Resection of ileum, 3 inches.	"	"	1	....	.....	Button passed 11 days after operation; perfect recovery.
7	June 16, 1894.	" "	Meyer, Willy.	Intussusception; intestinal obstruction, sarcoma.	Resection of ascending colon, 12 inches.	"	"	1	....	.....	Button passed 11 days after operation; discharged July 24, 1894; died of marasmus, Aug. 14, 1894. Autopsy, multiple sarcoma.
8	June 18, 1894.	*N.Y. Med. Jour.*, September, 1894.	D. Lilienthal.	Carcinoma of transverse colon.	Resection of transverse colon, 6 inches.	"	"	1	....	.....	One-and-three-quarters-inch (in diameter) button used; passed 18th day without pain.
9	Nov. 11, 1893.	(?)	Ricketts.	Carcinoma of ileum; obstruction.	Resection, end to end.	"	"	....	1	Shock, 10 hrs.	Time for operation, 10 minutes.
10	May 11, 1894.	*Mathews's Med. Quar.*, July, 1894.	Outerbridge	Carcinoma of transverse colon.	"						Time for operation, 1 hour and 45 minutes. Several inches of transverse colon resected.
11	June 23, 1894.	Not published.	Meyer, Willy.	Carcinoma of rectum.	Resection of rectum, 8 in.;	"	"	1	....	.....	Death July 22. Gangrene of lower end of sigmoid with fæcal fistula above line of union, due to tension of meso-sigmoid. Button accomplished purpose admirably; voided on 11th day.
					Kraske, Rehn.	"	"	1	....	.....	
12	June 1, 1894.	" "	Cobb, J. O.	Syphilitic stricture.	Anastomosis around stricture.	"	"	1	....	.....	Death 14 days later, of pneumonia; autopsy; perfect approximation.
13	Feb. 27, 1894.	" "	Ferguson, A. H.	Cancer of cæcum.	Extirpation of cæcum; 14 in. of bowel.	"	E. to s.	1	....	.....	Patient died 4 weeks later of diarrhœa; autopsy; perfect approximation; opening large as button; diphtheritic colitis.

14	June 17, 1894.	Not published.		Davis, T. A.	Penetrating wound of abdomen; laceration of intestine.	Resection, end to end.	Murphy button.	E. to e.	....	1	3 hours' shock.	Never rallied from shock or injury.
15	Aug. 31, 1894.	"	"	Beck, Carl.	Carcinoma of cæcum.	Resection of cæcum.	"	L.	1	.. .	.....	Ends of intestines sutured; lateral anastomosis with button No. 3.
16	June 4, 1894.	"	"	Murphy, J. B.	Fæcal fistula.	Resection, end to end.	"	E. to e.	1	....	.....	Removed 25 inches of small intestine; opening made by button in previous operation had dilated from 3½ up to 5 inches.
17	Jan. 28, 1894.	"	"	Middleton, W. D.	Carcinoma of rectum.	Resection of upper part of rectum, 2½ in.	"	"	1	....	.....	Completely cured; button passed on 12th day.
18	July 7, 1894.	"	"	Wiggin, F. H.	.....	Double anastomosis.	"	"	....	1	.....	Death, 60 hours after operation, from obstruction caused by a flexure in the intestines and adhesions at seat of operation, the buttons acting as anchors to hold the bowel in malposition; line of union at both places barely visible; pressure atrophy nearly complete; posterior to one button was a perforation which was closed by adhesions.
19	July 17, 1894.	"	"	Hartley, F.	Intestinal obstruction of five days' standing; gut gangrenous.	Resection, end to end.	"	"	1	....	.....	Button passed on 9th day; patient is well.
20	July 11, 1894.	"	"	Abbe, R.	Resection of caput coli.	Ileo-colic.	"	"	....	1	Fatal obstruction; hard fæcal matter.	Fatal obstruction by hard fæcal matter, which plugged the button, notwithstanding ileotomy.
21	April 25, 1894.	"	"	Abbe, R.	Union of splenic flexure of colon and sigmoid flexure.	.....	"	S. to s.	1	....	.....	Result good, but button never passed.
22	June 1, 1894.	"	"	Abbe, R.	Cancerous growth; resection and recovery of button.	.....	"	E. to e.	....	1	.....	Sloughing of bowel adjacent to the button, due, says the operator, I fear, to pressure of the metal. The button was sent to me by Dr. Murphy.
23	Aug. 18, 1894.	"	"	Silver, H. M.	Strangulated femoral hernia; resection of 3 inches.	.....	"	"	1	....	.....	Button passed on the 8th day. Sept. 21, patient in perfect health; no symptoms after operation.

SIDE-TO-SIDE ANASTOMOSIS.

No.	Date.	Publication.	Operator.	Diagnosis.	Operation.	Method.	Position.	Result. R.	Result. D.	Cause of death.	Remarks.
1	Aug. 16, 1894.	Not published.	Meyer, Willy.	Fæcal fistula.	Ileo-colostomy.	Murphy button.	S. to s.	1	....	.....	Oblong button used in this case, which passed on 10th day without pain or difficulty.

GASTRO-ENTEROSTOMY.

No.	Date.	Publication.	Operator.	Diagnosis.	Operation.	Method.	Position.	Result. R.	Result. D.	Cause of death.	Remarks.
1	May 5, 1894.	*Med. Week*, Paris, vol. ii, No. 38.	Quenu.	Epithelioma of stomach.	Gastro-jejunostomy.	Murphy button.	L.	1	....	.....	Time for operation, 1 hour and 55 minutes. Uneventful recovery; up in 18 days. Great increase in weight.
2	April 19, 1894.	Not published.	Bressler. (Baltimore.)	Obstruction of pylorus.	Gastro-enterostomy.	"	"	1	....	.....	Death 4 weeks later; exhaustion; button found at splenic flexure of colon retained by band of adhesion; no obstruction.
3	Aug. 13, 1894.	" "	Mayo, W. J.	Carcinoma of pylorus.	"	"	"	1	....	.....	Death 14 days after; broncho-pneumonia; autopsy; perfect union; button liberated; opening about twice as large as button.
4	Aug. 6, 1894.	" "	Meyer, Willy.	Malignant stricture of pylorus.	"	"	"	1	....	.....	Rapid recovery; discharged August 25, 1894.
5	Aug. 23, 1894.	" "	Meyer, Willy.	Carcinoma of pylorus.	"	"	"	1	....	.....	Patient still in hospital, doing well (September 6, 1894).

6	April 10, 1894.	*Buf. Med. and Surg. Jour.*, July, 1894.	Mynter, H.	Carcinoma of pylorus.	Gastro-enterostomy.	Murphy button.	L.	1	....	.....	Vomiting ceased; patient left hospital in 3 weeks.
7	May, 1894.	*Ibid.*	Mynter, H.	Carcinoma of pylorus.	"	"	"	....	1	Exhaustion, 12 hours.	
8	1894.	*Ibid.*	Mynter, H.	Carcinoma of pylorus.	"	"	"	....	1	.....	Smallest sized button used, which could not possibly grasp tissue and was never intended for that purpose. The wall of the stomach slipped out of its embrace and allowed contents to escape. A running suture is not necessary if proper size button is used.
9	July 21, 1893.	Not published.	Middleton, W. D.	Stricture of pylorus.	"	"	"	1	....	.....	Uneventful convalescence; patient gained 42 pounds in year following operation.
10	July, 1894.	" "	Middleton, W. D.	Carcinoma of pylorus.	"	"	"	....	1	Exhaustion 3d day.	Largest sized button used; patient very weak and emaciated previous to operation, from constant vomiting. Post-mortem revealed circumscribed peritonitis about site of operation; stomach eroded by a great ulcer 3 inches in diameter; pancreas and other organs involved; approximation perfect.
11	Aug. 1, 1894.	" "	Silver, H. M.	Carcinoma of pylorus.	"	"	"	....	1	Exhaustion, 8th day.	Button was still in position; method of its separation well illustrated.

THE ARTHROPATHIES OF LOCOMOTOR ATAXIA.

By Parker Syms, M. D., of New York County.

October 11, 1894.

In the issue of July 7, 1888, of the *New York Medical Journal*, I published a paper on "Arthropathia Tabidorum." My excuse for addressing you now on this subject is my desire to emphasise some points of importance, to state the results of my continued study of the disease, and because I believe this theme to be one of particular interest to the general practitioner, and yet one concerning which very little has been written.

The study of structural diseases of joints depending upon central and peripheral nerve lesions is of comparatively recent date. As progress has been made in this direction it has been found that a number of diseases of the nervous system may be responsible for grave arthropathies. These nerve lesions are usually those which belong to the degenerative variety, in which the essential tissues of the nerve centres or trunks are so altered as to no longer be proper nerve tissue, or in which there is absolute destruction or loss of the nerve structure. Among this class, those diseases which involve the posterior portion of the spinal cord, affecting sensation and circulatory conditions, are the ones which are particularly responsible for the joint diseases. Principal among them are locomotor ataxia and the condition known as syringomyelia.

Syringomyelia is a condition in which there are clefts or cavities in the substance of the spinal cord. Those clefts may be congenital, or may be the results of degenerative disease. In the latter case the disease consists of three stages—(1) the spinal cord is infiltrated with round cells and connective tissue nuclei; (2) the replacement of the medullary ele-

ments by a felt-like connective tissue increase or gliomatous mass; (3) this has a tendency to break down in its centre, leaving cavities lined with this felt-like connective tissue. These cavities usually contain clear serum, sometimes bloody or hyaline material.

Locomotor ataxia consists pathologically in degeneration of the posterior columns of the spinal cord, apparently extending from the centre outward; it finally involves the posterior nerve roots, often the lateral columns, and, as has been shown by careful investigators, the nerve trunks and terminals are also involved. The degeneration consists in atrophy and loss of the essential nerve tissue, accompanied by an increase of connective tissue and a deposit of fat.

That these and similar diseases do cause very grave and remarkable arthropathies is well known, and yet the exact relation of the spinal lesion to the joint trouble does not seem to be clear, and many opposed opinions and theories have been advanced.

The study of the aetiology of the arthropathies of locomotor ataxia needs first the study of the parent disease, and subsequently a study of the joint trouble.

The causes of locomotor ataxia are certainly not known, and are only surmised. All that can be said is that it is more common among men than among women; that it is a disease of middle and advanced life. In a very large per cent. of cases the patients have had syphilis. In the majority of cases one can obtain a history of excessive venery, of excessive brain and nerve tax, or excess in the use of alcohol. Often the onset is charged to some severe crisis involving exposure to wet and cold combined with physical exhaustion. There has been a great deal of dispute concerning the relation of syphilis to *tabes dorsalis*. I believe the majority of authors regard syphilis as the cause of locomotor ataxia, *i. e.*, that the disease occurs as the direct result of syphilis, and never in patients who have not been so infected. A few regard a previous history of syphilis as merely a coincidence,

and not as a cause, while some regard syphilis as one of several predisposing causes of the spinal lesion. My own conviction, based on the study of a sufficient number of joint cases, is that locomotor ataxia may occur independently of syphilis; that any prolonged and destructive tax upon the nervous system may so exhaust it that the circulatory conditions shall become unbalanced and the nutrition of the cells so altered as to result in degeneration of the nerve substance. Excess of venery, of prolonged intense nerve work, prolonged deprivation of sleep, rest, and nutrition, excess in the use of alcohol and in the exercise of nerve energy under stimulation, all diminish the opportunity for physiological rest, and for cell repair. Any grave disease, as tuberculosis or syphilis, also taxes the system, and not only may, but certainly does, act as a factor in the production of disease of the nerve centres. Certainly if syphilis is necessary for the production of *tabes dorsalis* there can be no case without it; but in a large number of tabetics one can neither obtain a history of syphilis, nor can he demonstrate any syphilitic lesion. Syphilis is unfortunately a very evident disease, and the cases which are severe enough to be the cause of locomotor ataxia may reasonably be expected to leave some impression on the patient's mind, if not upon his body. Certainly it is but surmise to claim that syphilis has been found in a patient when no evidence of the disease exists, and none can be recalled. It must be conceded that excess of venery is a predisposing cause of syphilis. Perhaps the excess which made the syphilitic infection possible may also have damaged the nervous system by exhausting and overtaxing its powers of repair.

Concerning the aetiology of the joint lesions in locomotor ataxia, I take the liberty of quoting from my former paper. It has been maintained:

1. That it is purely a mechanical condition caused by the abnormal gait of the patient, due to locomotor ataxia.

2. That it is due to a direct trophic disturbance of central origin—a certain point being involved for a corresponding joint; or that there is one centre responsible for the nutrition

of joints. (Buzzard suggests that this hypothetical point is in the medulla.)

3. That it is not a peculiar disease, but is (*a*) arthritis deformans coincident with the tabes, or (*b*) a purely syphilitic joint in the same connection.

4. That the serous effusion is due to trophic disturbance, and that the changes in the bone are due entirely to the pressure of the effusion and the consequent anaemia of the periosteum. (Macnamara.)

5. That it is due entirely to a traumatism, and that the primary changes are inflammatory, but, owing to analgesia, the joint is not kept at rest and progress is different, merely on that account, from ordinary traumatic arthritis.

6. That it is due to a direct trophic disturbance, like *ulcus perforans*, not of central origin, but due to atrophy of the peripheral nerves. (Weizsächer.) I understand this to mean that only the nerves of the diseased joint were atrophied, and therefore this joint became involved.

7. That it is due to traumatism or some change in the condition of the joint to be affected. The progress attained depends on the fact that the nerves of all large joints are degenerated, and some degeneration occurs in the structures of apparently healthy joints in tabetics, as pointed out by Jurgens and Westphal.

I am inclined to the last theory. The fact that the nerves and structures of seemingly healthy joints are in a state of partial degeneration has been demonstrated, and it only remains to assign a reason why a certain joint should continue in the process. I think it is reasonable to look for this in some local condition, such as traumatism. If it were simply a continuation of the degenerative process, other joints would be involved in time. But a patient may have a single joint affected for years.

The idea that it is dependent on the peculiar gait is not tenable, for the disease occurs before incoördination is present, and patients have developed it while lying in bed; also because it occurs in the upper extremity.

Neurologists have not found for us the central point alleged by Buzzard and Charcot, and changes in the peripheral nerves seem to explain the disease more satisfactorily. Charcot's disease differs in its pathology and symptoms from arthritic deformans and syphilitic joints sufficiently to give it an identity as a peculiar condition.

The idea that it is caused by the serous effusion, as suggested by Macnamara, it seems to me, does not need contradiction.

I do not consider it of a purely traumatic nature. The changes are none of them of an inflammatory nature, and certainly must be regarded as due to nerve changes.

The pathological changes in these joints are remarkable, involving both the bone and the soft parts, producing the most extreme deformities. The synovial membrane is usually anaemic, though sometimes congested. The capsule becomes very much thickened by connective tissue increase. The periarticular structures are often the seat of extensive connective tissues hyperplasia, and this mass forms a large part of the deformity. The entire capsule may be destroyed and be replaced by a mass of new connective tissue. There is always a hydrarthrosis early, and a peculiar effusion into the deep fascia and the soft parts, sometimes extending throughout the limb. The capsule and ligaments are stretched and distended by the swelling and hydrops. This gives an abnormal mobility to the joint. Ossification occurs in any of the tissues at and about the joint. Bone formations may be found in the tendons, muscles, fasciae, and capsules, or they may be formed as free bodies in the joint cavity. There are two classes of cases, owing to two sets of processes which occur in the bone tissue, viz., the hypertrophic and the atrophic. We may find a joint diseased in both manners, that is to say, one bone of the joint may be hypertrophied and the other atrophied. In the atrophic form the ends of the bone and the epiphyses are more or less absorbed, and the bone may terminate in a rounded end like a drum-stick.

The hypertrophic form produces great increase in the size

of the bone by large bony deposits and outgrowths on the epiphysis. These bony deposits are not confined to the epiphyses, but also involve the shaft, and are often found on the capsular and soft parts. Spontaneous fractures are very common. They may involve the shafts or the processes. These fractures may unite, often forming good union, but the callus is usually overabundant. The bone structure is changed microscopically and chemically. As in *osteitis rarificans*, the lamellae are absorbed and broken down so that several canaliculi are transformed into one large canal. The bone plates are thinned, and the canals are filled with fat. As in osteo-malacia, the phosphates are diminished to about eleven per cent., and the fat is increased to about thirty-seven per cent.

In the hypertrophic forms the joint functions are usually better than in the atrophic. In the latter, the opposing surfaces are diminished, and the lack of support allows great freedom of abnormal motions.

The symptoms are well marked, and the disease is easily recognised. As these joint affections come early in the course of locomotor ataxia, we may not have many symptoms of that disease present to aid our diagnosis ; but we are sure to find some. The prominent symptoms of tabes are darting neuralgic pains, numbness, and peculiar sensations in the feet and legs, perverted response to surface irritation, as an exaggerated sensation of cold applied to the skin, or the application of cold may produce a sensation of heat, etc. Tactile sensation is often delayed. Analgesia is a prominent early symptom of tabes, and is a constant condition. So is loss of patellar reflex. The Argyll-Robertson pupil is one of the characteristics of the disease. Incoördination of the muscles of the extremities is very prominent as a symptom, but it comes on late in the disease. Owing to the blunted sensation in the feet, there is more or less inability on the part of the patient to walk or stand steadily without the aid of sight, and in the dark, or with the eyes closed, he will sway and stagger. Inability to walk at night, and the peculiar sense

of numbness, are usually the first warnings to the patient of this disease of the spinal system.

The joint disease is characterised by its sudden onset and comparative absence of pain. Sometimes the first indication of the disease is a spontaneous fracture of a bone shaft, but usually there is a sudden and rapid swelling of the limb produced by an oedema of the deeper parts. This general swelling subsides, but the joint is found to be deformed, and remains enlarged. The peculiar deformity of the joint, its rapid development, the absence of pain, attended by some of the characteristic symptoms of locomotor ataxia, complete the means of diagnosis. It may be mistaken for arthritis deformans, but this latter disease comes on slowly, is attended by severe pain, and you will be aided in differentiating by the absence of the symptoms of tabes. Besides in arthritis deformans the motion of the joint is restricted, while in arthropathia tabidorum the joint is usually abnormally movable.

In these cases the disability is great, especially late in the spinal disease when incoördination is added; but I have never seen a patient who could not walk with the aid of crutches or a cane.

One of my cases has improved in his ability to walk owing to the fact that his knee, the seat of the disease, has become anchylosed, and though still greatly deformed, it is strong and gives him firm support. Six years ago when I first saw him, mobility was so great that he walked with much difficulty. Knowing that in these cases fractures would unite, I was of the opinion that resection of the knee in this case would be justifiable, and that he would be much improved by the operation. Nature has accomplished all that I could have hoped to do by operating, and I now know that I might have failed in my object.

This week I saw a case of this disease in a knee joint, in which resection had been done seven years ago by Dr. Willy Meyer, of this city. The final result shows that union of the bones had failed to take place; and while the man can walk

with a cane the joint is not better than the average of these cases in which no operation has been done. As I am ignorant of the man's original condition I am unable to state whether the operation was an advantage or not.

Beyond the use of splints in these cases where mobility is great, very little can be done in the way of treatment. The disease is permanent, and the patient I referred to above is the only one of my acquaintance who has improved. Further experience may show that resection is advisable. Notwithstanding the case above referred to, I am still of the opinion that we may expect union to take place after resection. If this be true, the operation would often afford great relief.

I have had no reason to change my conclusions as expressed six years ago. They are as follows:

1. That this is a peculiar disease depending on tabes dorsalis.
2. That it is due to trophic disturbance.
3. That it is of the nature of a degeneration, and not of an inflammation.
4. That syphilis is not a necessary factor of locomotor ataxia.
5. That in some cases excision of the diseased joint may be justifiable.

The following is the history of two typical cases which I take pleasure in showing you:

Case I. Henry Burt, sixty-two years of age, a sea cook by occupation. No history of syphilis and no evidence of syphilis. When six years of age was kicked by a horse, probably receiving a fracture of the right parietal bone. He says he was unconscious for six days, and that he bled a good deal; does not know if from ear or nose. There was no resulting paralysis of speech or motion. Since this accident he has been deaf in the right ear. His subsequent history is negative till 1883. At that time, after taking a bath and exposing himself to cold he suddenly developed what he calls a weakness in his legs. His gait was unsteady, and he was thought to be intoxicated. Soon he lost to a marked degree the natural sensation in his legs and feet; they felt numb and as though he walked on an uneven spongy surface. His symptoms have always been more marked on the left than on the right side. There was very little change in his condition till about the middle of the year 1887. At

that time his knee swelled to more than its present size within a week. It attained its present deformity within a month. The joint was very movable in all directions. When he stood it took a position of extreme abduction. When I first saw him, in the latter part of 1887, there was a peculiar hard swelling of the entire limb. There was a large, imperfectly movable mass below the middle of the thigh. This later became reduced in size, and ossified on the shaft of the femur. Examination five months after the attack of general swelling of the thigh, showed anaesthesia deep and superficial of both limbs; sensation not delayed; patellar reflex absent; pupils do not respond to light; patient sways when standing, or walking with closed eyes; left knee very much enlarged and deformed, measuring 10 cm. more than the right knee. There was some increase in the size of the entire limb; there was fluid in the joint cavity, marked crepitus on motion; lateral mobility greatly increased; general contour of joint lost owing to thickening of the capsule; internal capsule greatly hypertrophied. There was also a spine of bone, 10 cm. long on the inner side of the lower end of the shaft of the femur.

Examination on October 8, 1894, showed the left knee joint very much enlarged and deformed, measuring 10 cm. more than the right knee, over the patella; the knee was anchylosed; the position of leg was not one of normal extension, but abduction, causing a marked bow. Owing to the anchylosis the limb gave a firm support, and the patient was able to walk quite well.

Case II. Laura Holliday, admitted to the Coloured Hospital on March 21, 1894; fifty-four years of age. Evidence of old syphilis, but no history of the same. The present illness began in the early part of 1892, with numbness in both feet. In the fall of 1892 she began to have shooting pains in calves of legs. About December, 1892, her right knee became swollen, and caused her some pain. There were present the Argyll-Robertson pupil and loss of patellar reflex; sensation in the legs was delayed, and was also diminished; she swayed when standing with closed eyes. The right knee was greatly deformed and enlarged; the patella was firmly fixed to the femur; the lower end of the femur was greatly hypertrophied, especially at the inner condyle. The ligaments and capsule were much distended and stretched. The upper end of the tibia was somewhat atrophied, and was subluxated backwards and outwards. There was flexion to more than 90°; extension to more than a straight line; abduction to about a right-angle; adduction to about 45°. The right knee measured 7 cm. more than the left at the greatest circumference. The disability was great.

A CASE OF ECTOPIC PREGNANCY AT THE UTERO-TUBAL JUNCTION.

By E. D. FERGUSON, M. D., of Rensselaer County.

October 11, 1894.

The titles of many of the papers to be read at our meetings pass through my hands *en route* to the Committee of Arrangements. In that way, I became aware of the subject of Dr. Janvrin's paper, and it brought to my mind the case I am about to relate. I felt that it would be germane to his subject, and that it would illustrate a variety of the trouble that he would probably not dwell upon so fully as the more common forms.

The decade just passed has been marked by the development of much clearer ideas concerning ectopic pregnancy than we formerly had, though many things remain concerning which there may be honest difference of opinion, but it is now fully recognised that the accident occurs much more frequently than was formerly thought. To have told the gynaecologist of twenty-five years ago that nearly every case of pelvic haematoma or haematocele was associated with ectopic pregnancy would have seemed to him a very wild venture in pathology, but there are few who would now deny such a statement, while some would make the rule universal, though such a conclusion would not be justifiable, for other causes of pelvic haemorrhage may occasionally be present.

Then again, our ideas as to the locality of the misplaced gestation have been so modified that the majority are agreed that it occurs at some point between the abdominal and the uterine orifices of the Fallopian tubes and that the apparent location elsewhere is due to rupture of the tube and a displacement, usually more apparent than real, of the seat and source of the embryonic development. Whether a true abdominal pregnancy, i. e., a pregnancy where the first nidus is made within the peritonaeal cavity, can ever occur, is now a

subject for legitimate doubt, and many are convinced that it is a physiological impossibility.

It is certain that careful investigation has continued to lessen the proportion of cases of so-called abdominal pregnancy by showing a probable primary lodgment within the Fallopian tube, and the direction in which a rupture of the tube is most liable to occur according to the location of the ovum therein has been the subject of careful consideration and has produced valuable conclusions.

The discovery by one of our countrymen, Dr. A. W. Johnstone, of Kentucky, that each menstrual flow was attended by a more or less extensive exfoliation of the epithelial surface of the uterine cavity shows the probability that the fecundated ovum requires a somewhat *raw* surface in order to find the proper conditions for its nutritive supplies. This also throws a flood of light on the otherwise inexplicable fact that previous tubal disease may usually be found to have existed in cases of tubal pregnancy, for salpingitis would naturally favour the occurrence of breaks in the epithelial surface of the lining of the Fallopian tubes and the consequent production of conditions analogous to those found in the womb after the occurrence of menstruation. It is quite probable that tubal pregnancy would occur more frequently than it does were it not for the fact that the products of salpingitis, in an active or virulent form of the disease, would be liable to be destructive to the ovum, so that it is only when a proper balance between the superficial erosion of the mucosa and the production of septic material has been reached, that the ectopic pregnancy becomes probable or even possible.

With this introduction, I will leave the detailed consideration of the subject to Dr. Janvrin, and will relate the case which constitutes my text, and then briefly comment on its special points.

The patient, a woman 39 years of age, menstruated about April 1, 1893. She had eight living children, and two premature deliveries at seven and eight months. There was a slight "show" in May for a day or two.

On June 2, she was seized with sudden and severe pain in the hypogastrium, but I understand showed no evidence of notable shock. The

severity of the pain became less, but was followed by what seemed to be expulsive uterine pains, and a moderate amount of bloody discharge from the vagina. This condition continued until about July 9th, when she was seen and examined by Dr. T. C. Church, who concluded that there was probably a tubal pregnancy and requested me to see her with him. I examined the patient on July 10th, and found a tumor apparently about the size of a small cocoanut situated to the left of the uterus, which was crowded well to the right of the pelvis. This tumor seemed to be a direct extension of the uterus toward the left, in other words it seemed to be intimately connected with the womb. The patient had some fever, my recollection is that her temperature was between 101° and 102° F.

The conclusion was that extra-uterine pregnancy existed, and I ventured the prediction that it had occurred at or about the utero-tubal junction, that rupture in the tube had occurred downwards at or near the womb, and that the haematoma had not passed on to a secondary rupture. The uterus itself was manifestly somewhat enlarged, but it was not considered of sufficient importance to try and recognise the degree of enlargement.

In view of the fact that the pain in the hypogastrium had been increasing for a few days, and it being probable that the haematoma had somewhat increased in size, the inference was natural that the fever was due either to recent haemorrhage and resorption of fibrinogen, or that suppuration was about to occur. The evidence favoured recent haemorrhage with its attendant liability to rupture into the abdominal cavity, and consequently prompt operative measures were advised.

On the following morning the abdomen was opened, and the haematoma and womb brought into view. The haematoma was directly continuous with the uterus on its left border, rising somewhat above the womb and carrying the Fallopian tube on its upper surface. The tissues covering the haematoma were healthy except at the junction of the tube and womb, and there the tissues were thinned and had yielded so as to form two prominences, apparently one on each side of the tube, each prominence being about the size of a small English walnut. The tissues at that point had become very thin, so that considerable care was needed to avoid a premature rupture.

It was manifestly impossible to remove all the parts constituting the haematoma without removing the uterus, and exposing the patient to the needless risk. Consequently the parietal peritonaeum was stitched to the uterus and the walls of the haematoma a little distance from and around the thin and prominent points before noted, and the remainder of the abdominal wound was closed.

The thinned portion was then ruptured by moderate pressure, and the opening enlarged so as to give access to the sac. There were fresh portions in the clot showing recent haemorrhage.

It was not deemed expedient to remove all the clot as such a course would be very liable to result in fresh and probably troublesome haemorrhage. The ovum was not seen, but it was thought that portions of

the membranes were found. On removing the upper portion of the clot, it was observed that the left horn of the womb was quite deeply hollowed, showing that it had been occupied by the ovum before rupture.

After removing the clot so far as seemed expedient, probably three fourths of it, the cavity was filled with iodoform gauze and a dressing applied.

The future history was uneventful and complete closure resulted in a few weeks. She has menstruated regularly since, except at one period when she passed the expected date by a few days, and fearing pregnancy, she lifted a wash tub of water "to bring on her courses," and succeeded in bringing on a hernia at the site of the incision.

In cases of ectopic pregnancy having their site at the tubo-uterine junction, it is probable that the point of primary rupture will usually be downwards between the layers of the broad ligament, and a haematoma similar to the one I have described will be found.

It does not seem that any argument is needed to justify the course adopted in this case, i. e., attachment of the sac to the lower angle of the incision and subsequent drainage, for any procedure to remove the entire mass would imply protracted and serious measures where a relatively simple one would suffice. I believe that such a course is the one usually adopted in such cases.

THE EARLY DIAGNOSIS OF TUBAL PREGNANCY, AND "PRIMARY LAPAROTOMY" IN SUCH CASES—REPORT OF A SUCCESSFUL CASE OPERATED UPON BETWEEN THE SEVENTH AND EIGHTH WEEKS OF GESTATION.

By J. E. Janvrin, M. D., of New York County.

October 11, 1894.

The following case is a typical one of commencing rupture of the tube, recognised while the haemorrhage was in its very earliest stage and operated upon within a few hours; and it is reported more especially to give additional confirmation to the propositions which the author advanced in two papers read before the American Gynaecological Association—the first in September, 1886, and the second in September, 1888—and another paper entitled "Primary Laparotomy in Tubal Pregnancy" read before the Medical Association of the County of New York early in April, 1888.

In my first paper my conclusions were as follows: "I would submit the following as embodying my own ideas as to the proper treatment to be resorted to in certain cases of undoubted tubal pregnancy; that in cases where a moderate haemorrhage has been positively diagnosed (whether from a rupture of a superficial artery or venous plexus, or from a partial rupture of the sac itself), and this haemorrhage has occurred prior to the termination of the fourth month of gestation, it is undoubtedly better surgery to perform laparotomy at once, and thus remove all possible danger of further haemorrhage, than to trust to electricity in any form. Cases of this kind, in which a positive diagnosis can be made, have been rare up to the present time; principally, I think, from the fact that the full significance of the so called

'colicky pains,' with the shock and collapse, has hardly been appreciated. I am convinced that in these attacks there is always some bleeding, it may be very slight, from the superficial vessels of the (tubal) sac; and that as a rule several attacks occur before the real rupture of the sac takes place. If I am right in this, it seems to me that in all such cases, where the symptoms of haemorrhage are becoming at all alarming, we should at once resort to laparotomy."

These conclusions just quoted from my paper of 1886 were based upon the report of a case in which I had diagnosed the existence of tubal pregnancy as early as the fifth week of gestation, and in which a slight haemorrhage had occurred from a ruptured superficial artery in the peritonaeal covering of the sac a few days subsequently, and in which, also, some ten days later, galvanism was used on three successive days for the purpose of destroying the child, and on the day following the third application the haemorrhage had recurred so profusely as to destroy the patient's life within a few minutes. The post mortem showed the haemorrhage to have occurred from the rupture of an artery in the peritonaeal covering of the tube (sac) and no rupture of the sac itself. The sac contained a two months foetus.

In my paper read before the Medical Association of the County of New York early in April, 1888, the term "*Primary* Laparotomy in Tubal Pregnancy" was first made use of, and the performance of the operation was strongly urged, as also in the paper of September, 1888, in all cases in which the symptoms pointed to the existence of tubal pregnancy. This proposition was simply the substitution of laparotomy in place of electricity in all cases of extra-uterine pregnancy diagnosed as tubal—and which had either not even begun to rupture or were just beginning to show symptoms of impending rupture.

It may not be out of place to quote from my paper of that date that portion pertaining to the symptoms upon which was based the propriety of "Primary Laparotomy in Tubal Pregnancy," especially as at that time, and for some years

subsequently, many unfavourable criticisms were encountered from eminent gynaecologists, and grave doubts were expressed as to the propriety of opening the abdomen in cases in which it was supposed that the use of galvanism would accomplish all that was needed. The quotation is as follows: "The passing over one period, followed as a rule in the course of a week or two by a slight 'show,' this show continuing for only a few minutes, or a few hours at the most, and repeated in all probability within a week, while at the same time the usual symptoms of pregnancy exist, should be sufficient to arrest the attention of the physician and notify him that pregnancy probably exists. An examination of the expelled fluid will almost invariably show the existence of decidual membrane, either in shreds or in pretty well defined membranous condition. Physical examination of the patient reveals the os uteri softened and patulous, the uterus slightly enlarged and heavier than normal, and almost always tipped to one or the other side of the median line, the inclination always being away from the tube which contains the foetus. If the tube occupies its normal site (and generally it does), it will be felt as a semi-elastic, globular mass to the right or left of the uterus, as the case may be, probably not larger than a pullet's egg or a small lemon, sometimes movable, though generally very slightly so, and at all times very sensitive to the least touch or manipulation. In addition to these symptoms we get the strong arterial pulsation in the tumor. This symptom (extreme sensitiveness) I consider very diagnostic of this condition when taken in conjunction with the other symptoms. Of course the position of the tube may vary. It may drop down to the level of the os uteri, or it may fall backward into the *cul de sac*.

"Whatever position it assumes the mass is easily made out, and the only question which can come up is that relating to its character. The attacks of colicky pains, and the shock accompanying them, are simply indications of slight lacerations of the nerve filaments in, and slight haemorrhages from, the peritonaeal surface of the tube, caused by the growing

foetus and placenta. With this train of symptoms existing it is *perfectly* justifiable to explore the cavity of the uterus. Usually it will be found not more than three inches in depth at the fourth or fifth week of gestation, and rarely exceeds three and a half at the third or fourth month."

During the past six or eight years, since the foregoing was published, many successful cases of laparotomy for *ruptured tubal* pregnancy, *i. e.*, cases in which the tube had really ruptured and the patients were sinking from haemorrhage, have been reported. (Some few cases of this character had been successfully operated upon before that date.) These cases, of course, do not come under the term "Primary" but are *secondary* in every respect.

Scores of lives have been saved by these timely operations but still every once in a while we read of cases in which, on account of some slight doubt as to the existence of this form of pregnancy, and a consequent delay of a few days in waiting for more decided symptoms, the life of the patient has been lost by a sudden and uncontrollable haemorrhage. As stated at the beginning of this paper, this case is reported as confirmatory of the statements made some eight years since. I give the history of the case in the words of the family physician, Dr. Henry Moffat, of Yonkers, N. Y., up to the date when I was called in consultation.

Mrs. G. B., aged thirty-five; mother of three children, the youngest five years old. Had two miscarriages, one six and the other seven years ago. No symptom of uterine disease since birth of last child. Menses regular.

During the past winter patient troubled with chronic malarial poisoning, and consequently somewhat anaemic. Last regular menstrual epoch, April 10, 1894. No appearance in May till the 27th, when a slight, irregular, and intermittent flow began. This condition lasted till June 11. She then first sent for me, because of an intense paroxysmal pain in the right iliac region. The pain extended down the thighs and back into the rectum, rendering the sitting position intensely disagreeable. The paroxysm lasted about two hours, and gradually disappeared. There was no elevation of temperature. Pulse normal, and 76. The abdomen was tympanitic, but no marked tenderness except low down in the iliac region. Examination per vaginam showed uterus in normal

position and movable, os contracted, slight tenderness in the region of right ovary; no flowing at this time.

That night she had another paroxysm of pain, followed by some slight uterine haemorrhage. June 12 she was comparatively comfortable all day. Pain controlled by morphia June 13. Flow increasing, and during night two pieces of membrane, size of my finger, were discharged. June 14 examination showed os dilated, uterus pushed to the left, and fundus tilted backward by a soft, tender mass low down in Douglas's pouch. The mass also extended toward the region of the right ovary. Abdomen was more markedly tympanitic, though not at all tender. Temperature, 100°; pulse, 96; respiration, 28. Bowels could not be moved. Examination of urine showed nothing abnormal. Sent for Dr. Jauvrin in consultation.

I saw the patient in consultation with Dr. Moffat that evening, and found the conditions as described by the doctor. The symptoms pointed unmistakably to a pregnancy of the right tube, in which rupture was already impending. The haemorrhage, however, if any had taken place, was very slight, the whole mass not exceeding in size a small lemon, and I thought it probably confined within the folds of the broad ligament. This seemed to me to be the case from the fact that there had been scarcely any shock, and everything seemed to be absolutely encysted. Even with this favourable condition, however, we agreed that an early laparotomy was absolutely demanded.

With this understanding I returned home, and at once made preparations for operating on the following afternoon, holding myself in readiness to do so at any intervening moment should I receive word from Dr. Moffat that any unfavourable change had occurred.

The following afternoon at 3 o'clock I examined the patient again, previous to etherisation, and found the mass at least four times larger than on the preceding evening.

During the forenoon the patient had had a recurrence of pain in the right iliac region, but there had been no shock or collapse. Temperature at this time (3 p. m.), 100.2°; pulse, 100. Considerable tympanitis (from gas in intestines).

Dr. Moffat immediately etherised the patient, and with the

assistance of my associate, Dr. Goffe (after curetting, washing out, and tamponing the uterus), I did a rapid laparotomy.

On opening the abdominal cavity and passing the fingers of the left hand into it, I readily grasped the right tube, together with its contents, and drew it slightly away from the uterine body, then applying a pair of clamp forceps directly back of my fingers, it took in the whole tube and upper half of the broad ligament close to the uterus. Lifting it up and transfixing it with a double ligature were quickly accomplished, the ligatures tied, and the mass removed entire.

The pelvic cavity contained over a pint of fluid and clotted blood. It was perfectly fresh, and was evidently principally the accumulation of that morning. All the clots were removed, and the pelvic cavity carefully washed out with boiled water at 115°, and also thoroughly sponged out. The appendix vermiformis was found in a congested and swollen condition, and consequently it, too, was removed. During the following thirty-six hours some difficulty was experienced in getting the bowels to move properly, but aside from this no unpleasant condition occurred. In fact, convalescence was very rapid and perfectly satisfactory.

The specimen was sent to Dr. Charles Heitzman for examination, and the following is his report:

39 W. 45TH ST., NEW YORK, June 22, 1894.

Dr. J. E. Janvrin:

DEAR DOCTOR: My report of the case of tubal pregnancy is as follows: The right ovary enlarged to double its normal size, succulent and holding a burst follicle filled with blood, the size of a small cherry. Attached to it is a cyst the size of a hazel nut, evidently starting from the parovarium. The ovary is closely connected with the fimbriated extremity of the right tube, which is enormously enlarged, the fimbriae being conglomerated into one mass. About one inch from the fimbriated extremity is the place of rupture, marked by a clot of blood. Here a cavity is seen, one fourth of an inch wide, lined with decidual tissue. The latter shows villosities in an early stage of development, consisting of medullary tissue and freely beset with protoplasmic buds. No embryo could be found. The peritonaeal lining of the tube in this situation is much thickened. That portion of the tube toward the uterus is nearly normal. The shreds removed from the uterine cavity

are papillary in nature, and, aside from juvenile connective-tissue, show decidual elements. Diagnosis: Ruptured tubal pregnancy. As to the age, judging from the clot in the Graafian follicle and the stage of development of the tubal decidua, I would put it between the seventh and eighth week. The beautiful specimen is at your disposal any time.

Yours truly,

Dr. C. Heitzman.

It will be seen from this report that the diagnosis was fully confirmed, and that the operation was done none too soon. The rupture of the tube was of limited extent, and had undoubtedly occurred at about 9 a. m. (six hours before laparotomy was performed). Undoubtedly the foetus had escaped at that time, or had been pressed out by my fingers when I grasped the tube. It certainly had not escaped on the evening prior to the laparotomy. And this brings me to the point upon which I wish to lay especial stress, viz., the almost certain accuracy with which we can diagnose an *impending rupture* of the tube, even as early as the fifth week of tubal gestation, if we follow the train of symptoms as set forth in my papers published (as before stated) six and eight years ago; and also the *absolute justifiability* of an exploratory laparotomy as recommended at that time.

IMMEDIATE RESTORATION OF THE FUNCTION OF THE LUNG AND PLEURA AND PERMANENT RECOVERY AFTER THORACENTESIS.

By Charles A. Leale, M. D., of New York County.

October 11, 1894.

It is now more than nine years since a New York physician brought his son, aged seven years, to my office for a physical and mental examination.

Dr. A—— then informed me that his son for the previous six months had changed from an active, cheerful, and bright boy to an indolent, dull scholar; they were also afraid that his attendance at school must cease, as he was too weak even to stand up in his class. The child most of the time either wanted to remain in bed or sit in a comfortable chair. He could not perform the same mental exercises that he was able to do a year before.

The parents suggested that during the previous four years he had been crammed too much, so as to keep him at the head of his class, and that this mental and physical reaction might indicate that his schooling must, at least temporarily, cease. The boy, even after a good night's rest, if sent up one flight of stairs for his books, became so exhausted that he said he was too tired to go to school. At no time could he run or play without becoming livid in the face. It was stated that he lacked energy, and that as he grew older he would be as other boys; but his more observing mother told me that she was afraid something was wrong, as he had always been healthful, active, and unusually intelligent since his birth, having had only a slight fever, lasting for two weeks, about six months before the time she had noticed the change.

On examining the boy's head, eyes, nose, and throat, I found nothing abnormal; but after the removal of his clothing a diagnosis was quickly made, for I found the boy's left thorax so filled with liquid as to completely compress the left lung and push the heart toward the right side, causing not only its embarrassed action, but even compressing the lower portion of the right lung. The over-worked heart always kept him in a condition of fatigue, and the diminished pulmonary action prevented his brain from receiving a supply of properly aerated blood. We therefore had an explanation for all his symptoms, and found that the boy had had a serous effusion in his thorax of several months' duration, not accompanied by either pain or elevated temperature.

The application of the law that sounds are transmitted through liquids inversely to their density, enabled me to diagnosticate a serous effusion, although the pale, cachectic appearance of the boy and the long duration of the effusion were more symptomatic of a collection of pus.

After deciding upon an operation and after I had informed the father that the child's future would be better if an anaesthetic were not administered, the doctor stated that he much preferred it done without general anaesthesia.

On June 12, 1885, I opened his chest with very little pain and without the loss of a teaspoonful of blood, and removed twelve and one half ounces of clear serum, which in an hour after its withdrawal became a solid, gelatinous mass, resembling calf's-foot jelly.

The father, a physician, sat in a strong chair, holding his son on his lap, with one arm of the boy passed under his, and the boy's opposite arm held up on his father's shoulder, the face of the boy being between the chair and shoulder of his father.

This position presents many advantages:

1. It directly exposes to the light and to the face of the operator the side and back of the affected side.

2. It makes the lowest portion of the thoracic cavity at the twelfth rib, near the spinal column, the most dependent part.

3. It enables the one holding the child to easily draw the skin tensely up over the ribs, thereby lessening the depth of the skin, and causing the skin to make the opening valvular at the completion of the operation.

4. It permits the compressed lung, as the fluid is being removed, to expand with greater facility; it being the uppermost, and free from the compressing restraint of the other side, which is firmly held by the assistant.

5. It prevents the patient from witnessing an operation, which is frequently made with very little or no pain.

6. It enables the operator to remove all or part of the effusion as he may deem most judicious.

7. By this procedure the valvular character of the wound may easily be maintained and thereby the admission of atmospheric air be prevented.

8. It permits the patient to make stronger efforts to expand the heretofore compressed lung.

During the operation I encouraged the child to cry vigourously, and thereby had his mind diverted, and he necessarily was forced to make stronger efforts to inflate his compressed lung and possibly to overcome minor plastic adhesions.

The withdrawal of the fluid having been gradually and slowly accomplished, the lung had an opportunity to steadily regain its inflatibility.

Intervals of rest were permitted during the operation, but the child was held in the same position until all had been completed.

The operation lasted about fifteen minutes, after which the boy readily got down from his father's lap, and when informed that all was over, laughed, saying that he could take a much longer breath and that he was without pain. No air was admitted during the operation. The opening was hermetically sealed by painting the wound with four layers of contractile collodion.

When he had sufficiently recovered from the fatigue and had several times walked about the room, the doctor and I examined him and found that he had regained the use of the

entire lung, that the normal resonance clearly demonstrated that all the fluid had been removed from the thoracic cavity, and that the lung had regained its proper function.

Later in the summer he was taken to the Catskill mountains, where his general condition rapidly improved.

Re-examination.

March 19, 1886, Dr. A—— brought his son to my office, stating that since the operation he had had a prolonged and severe attack of whooping cough, from which he recovered. I then made a careful physical examination and found that there had been a permanent restoration to health of not only the lung but also the pleura.

Over two years after the operation the doctor informed me that there had never been any return of the effusion, and that the single operation was the cause of a complete recovery; and now, nearly ten years after the operation, he is a strong, well developed boy.

The following letter was received with the statement that it might be used for publication:

NEW YORK, September 15, 1885.

My Dear Doctor:

My family has just returned from the Catskills and I find that my little boy has completely recovered the use of left lung. You will remember I called you in July last to explore his chest as he was suffering from chronic pleurisy. You then, on finding serum, drew off one pint of liquid. His left lung at that time was compressed by the fluid, the apex beat of heart in the epigastrium. I was astonished that after the operation the boy jumped from my lap, dressed himself, expressed himself as "so much relieved," and commenced to play, which he had not done for two or three months. There was not the slightest disturbance, no fever, no difficulty whatever. Considering the amount of liquid drawn off, I consider it as one of the most successful cases on record.

He has not taken any medicine, and there is no sign of the fluid accumulating again; he has gained in flesh, and altho' he has the whooping cough at present, it does not seem to affect him in the least.

Please accept my thanks for the services rendered me.

Very truly yours,

JOSEPH ANDERSON.

Dr. Charles A. Leale, 604 Madison avenue.

The accompanying photograph explains with an instantaneous view my method in this instance of holding the child, and the location of opening, viz., beneath the angle of the scapula and between the ninth and tenth ribs.

Mode of Operation.

Produce local anaesthesia by the hypodermic injection of a sufficient amount of the solution of cocaine to render an area of only one inch in diameter insensible to pain. The same result may be accomplished by the application of a piece of ice held over the same extent of surface sufficiently long to benumb its sensibility. Then draw the skin upward, and with a small scalpel or tenotomy knife cut through the integument; then permit the skin to fall so that the incision is directly above the edge of the tenth rib, when the incision is extended over the border through to the pleural sac, taking care not to wound the inter-costal artery, which is found at the lower edge of each rib. My cut is between half an inch and an inch in length, usually about three quarters of an inch. As the knife is withdrawn the wound is kept closed by compressing the skin from each of the opposite sides with the thumb and fingers.

The aseptic tube, with side openings, is pushed about one inch within the thoracic cavity, and with the double action aspirator the desirable quantity of the liquid is gradually withdrawn. When the tube is taken out the wound is hermetically closed by one or two silver sutures, if necessary, and covered with several coats of contractile collodion. Sometimes a roller bandage encircling the chest is desirable.

The patient must now be encouraged to use the heretofore compressed lung and kept away from all sources of tubercular infection, and have the best hygienic surroundings and the most nutritious food.

The function of the lungs is respiration. The function of the pleurae is to facilitate the action of the lungs. When the lung on one side of the body is entirely compressed by an accumulation of fluid within the pleural sac, the function of

that lung is suspended, and the life of the individual is maintained by the continuance of the function of the lung on the opposite side, and its action is facilitated by the smooth, moistened coverings of the pulmonary and costal pleurae.

In acute pleurisy accompanied by hydrothorax we have the pleural sac so abnormally filled with the translucent serum that more or less impairment of the function of respiration ensues. This may be temporary or transitory. In a large majority of cases, after all inflammatory action has ceased, the open mouths in the serous membrane as rapidly receive the abnormal serous accumulation as it is exuded, and we have a spontaneous cure without resorting to thoracentesis.

In empyema we find a different liquid exuded, which in a short time presents the appearance of pus, and quickly becomes more and more dense in proportion to the length of time that it has been retained within the hermetically closed sac of the pleurae. This pus, under the most favourable conditions, may be absorbed without any surgical operation.

Such cures are also called spontaneous, but there are instances where months or years have intervened, and yet by the powers of nature or the action of medicine no change toward removal follows; and the compressed lung surrounded by the filled pleural sac, ceases in part or wholly to perform the function of respiration.

It is in such cases that a surgical procedure is necessary to empty the pleura and liberate the lung, so that the individual, by the act of inspiration, may inflate the lung within the now roomy cavity of the thorax.

After thorough evacuation, although the thorax now contains no liquid, yet examination frequently shows a damaged serous surface, tissues which are changed by a deep inflammatory exudation extending to the parenchyma of the lung, composed mostly of fibrous tissue, having a very low degree of vitality, and in many parts so extensive as to have completely obliterated all traces of the heretofore existing normal serous membrane.

The portions of new exudate may resemble plaques of

fibrous exudate, and if produced on the opposing surfaces cause firm adhesions, binding down the lung, preventing free expansions and a return to complete functional action.

In children I have known the entire lung to be kept in a firmly collapsed condition for months without the parenchyma becoming permanently injured; and after relief by thoracentesis the lung has again become fully dilatable and has resumed its function, showing after death, which has followed from other causes in later years, that there was not a trace of disease in any portion of the lung tissue, and that the original extensive exudate on both the pulmonary and costal pleurae had in many places been firmly adherent; also that a new tissue had gradually covered the lungs, which became sufficiently elastic to permit pulmonary expansion, presenting the analogous appearance of cicatricial tissue of the skin after extensive burning, whereby the inflammation had destroyed a large surface, but here and there leaving spots of epithelium acting as minute islands, which under favourable circumstances grew larger and larger until a new covering of protection had been formed, but never completely resuming the exact appearance of congenital skin. Neither do we have, after localised destruction of portions of the pleura, a complete return to its original appearance. Yet the newly-formed covering replacing the original serous membrane is sufficiently useful, when taken with the other portions of secreting surfaces not heretofore destroyed, to maintain the function of the pleura to a sufficient degree for all practical purposes.

One of the worst drawbacks to the restoration of the lung and pleura after thoracentesis is where the lung has been penetrated or torn, subsequent examination having revealed that the patient was actually changed from an easily curable to an almost incurable condition; as I have seen when the necrosis of the injured pulmonary veins sloughed and air was admitted through them to the general circulation, sudden death following.

In the subsequent treatment after thoracentesis, the pathological changes which have taken place in the lungs and

pleurae teach us that we must caution our patients against the too forcible expansion of the lungs by violent exercise, whereby adhesions may be forcibly torn, the parenchyma and blood vessels of the lung ruptured, fatal haemorrhage following. Again, we must never expect in an old subject, where ossification of the ribs has become complete, that the chest will ever resume its normal rotundity.

These patients have, in consequence of nature's endeavours to occupy the empty, bony cavity of the chest, a change of position of internal viscera and a general contraction resulting in an antero-posterior curvature of the spine, as well as a flattening at the infraclavicular portion of the thorax. They therefore appear round shouldered and by the ignorant are requested to stand erect, which they can never do without great danger of tearing the pleura, bringing on a haemorrhage, ending in either immediate death or probably the lacerations becoming the seat of future tuberculous degeneration, which may gradually permeate other pulmonary portions and after the lapse of years cause death from tuberculosis.

I have met with cases of hydrothorax where, after all the inflammatory action had ceased, no effort at absorption was made until the slight irritation apparently changed a latent collection to one where rapid absorption followed, as, for instance, in a boy, aged 19, whose filled thorax caused difficulty in breathing when he even turned in bed. I here withdrew half an ounce for diagnostic purposes and said I would decide in three days whether it would be necessary to complete the removal. At the end of this time, however, I found on auscultation and percussion, that all the fluid had been absorbed and the previously compressed lung was rapidly regaining its function. The recovery in this case was complete.

Much has been written by those advocating exsection of the ribs, in endeavours to prove their assertions that it facilitated the removal of large masses of coagulated lymph, which they had found after thoracentesis. From an analysis of reported cases, I am firmly convinced that this very coagu-

lated mass has often been the direct result of the chemicals used in irrigation. I am aware that there are cases where the exudate has become so dense as to form an entire cast of the thoracic cavity; but these are very rare and even in such cases a resort to the removal of this inter-thoracic cast might lead to a directly fatal result. In operations upon the thorax we must never forget the welfare of our patients and personal experience in a large number of cases has taught me that we must have perfect cleanliness, as small an incision through the walls of the thorax as possible, slow removal of all the liquid, immediate closure of the wound, and a subsequent judicious guidance towards health.

It is far better to run the exceptional risk of operating again, than to cause an irreparable destruction of tissue or necrosis by exposing the extensive surface of the pleura to septic infection.

URETERO-INTESTINAL FISTULA, AS A RESULT OF ABDOMINAL ABSCESS, NOT DUE TO APPENDICITIS, WITH RECOVERY.

By A. T. Van Vranken, M. D., of Albany County.

October 11, 1894.

Present day literature, medical and surgical, at least, is plethoric, metaphorically speaking, with reports of cases of abdominal abscess incident to, and largely the result of, appendicitis. It will therefore be refreshing, if not unique, to bring before you a genuine case of abdominal abscess, presumably not due to an inflamed, belligerent, or obstructed appendix.

On February 12 of the present year, I was called to see E. K., forty-five years of age, a German by birth, and a cigar-maker by occupation. Mr. K. was of slender build, weighing not more than 125 pounds, and had been confined to the house about a week. I found him scarcely able to walk on account of severe pain in the left hip and thigh which extended to the knee posteriorly, and which was much aggravated by any motion of the leg on the affected side. There had been some nausea, much general unrest, slight chills, and a moderate fever, with a temperature of 100.5° at the time of my visit. A careful inquiry concerning the patient's previous history was negative as to any specific disease, excessive constipation, or in fact anything that might reasonably have been a factor in causing his present condition. I learned, however, that two weeks previous to the present attack, he had undergone violent physical exercise in shovelling snow, and being unused to this kind of work had experienced an unusual amount of fatigue therefrom. At the time of my visit no abdominal tenderness was recognised in general, nor localised areas in particular, and I felt justified in diagnosing the difficulty as being rheumatic in character, presumably sciatic, and prescribed accordingly, instructing the patient to take absolute rest in bed. Two weeks of this treatment was of no apparent benefit. At the end of that time a small, nodular swelling was observed in the groin directly above, and at the outer third of, Poupart's ligament. This yielded very readily

to treatment, and disappeared entirely in a week, when I allowed the patient to walk about the house, as he was feeling practically well, and we considered the trouble over.

A very few days, however, abruptly ended this delusion. Severe pain appeared in the region before spoken of, accompanied by all the symptoms of suppuration, and the reappearance of the swelling in the original locality soon convinced me that we were dealing with an abscess, and not with sciatic rheumatism, and the treatment was at once directed to that end. On the 13th of March, now one month from the beginning of the attack, and at the earliest moment when pus was detected, the most prominent part of the swelling was freely laid open, followed by the discharge of at least one pint of bloody pus. To my surprise this discharge was preceded and accompanied by a comparatively large amount of gas, having no special odour other than that ordinarily belonging to an accumulation of retained secretion. After the cavity had been apparently emptied of its contents a drainage tent was introduced and allowed to remain for twenty-four hours. Upon its removal the following day, there occurred the same musical accompaniment of gas in large quantities, which in turn was succeeded by as nice a faecal evacuation as any respectable rectum or anus could desire. Just here let me say in parenthesis, that this faecal discharge was in colour and character as typical of the genuine typhoid as any I have ever seen; and in response to my inquiry the patient's wife stated that his ordinary movements of the bowels had been similar to this and quite frequent, for some time past.

Four days after the opening of the abscess, the patient was put upon the operating table. Very liberal and free incisions were made by my friend, Dr. Ferguson, the walls of the cavity were thoroughly scraped with the finger, exposing the intestine, and an opening through the latter was found well up on the descending colon, at least eight inches or more above the external wound. This was well packed to its bottom with iodoform gauze, and repeated daily for two weeks. Very much to our gratification, the faecal discharge ceased entirely within ten days, and two weeks after the operation a half inch rubber drainage tube eight inches long was substituted for the gauze, and daily irrigation with a weak solution of carbolic acid employed. This tube was removed on the 23d of April. About one week before its removal, and when the flow of pus from within had nearly ceased, it was observed that a watery discharge was welling up through the tube, but assuming that this was only a return of the carbolic wash, no particular attention was given it. The latter was then discontinued, with no appreciable effect on the discharge of water, and an examination of this, collected by a catheter introduced in the wound, showed it to be normal urine; thus proving the existence of an opening into the left ureter, presumably not far from

the kidney. The flow of urine from the now fistulous opening, continued uninterruptedly for several weeks, but gradually decreased and ceased entirely within a month. After removing the rubber drainage tube the wound was kept open by the daily introduction of a gauze drainage tent, until, in July, its small calibre and gradually decreasing depth forbade its further use, and it was discontinued. Early in August, now six months after the original abscess, the abdominal opening closed spontaneously, and the patient, whose photograph I now submit, was discharged cured.

During the progress of this case physician and patient alike experienced many anxious hours. For weeks death seemed inevitable from starvation, and a body reduced to skeleton proportions, and ornamented with bed sores, gave small probabilities for ultimate recovery. The *vis medicatrix naturae*, however, like truth was mighty, and prevailed.

I have thus, at the risk of tediousness, gone somewhat minutely into the clinical history of this case, which has certainly been an unusual one in some of its features. That I should have made an error in diagnosis at the outset is perhaps excusable, as interpreted by later events.

There are two possibilities in the case which are, at least, worthy of mention. Fortunately for the patient, an autopsy, which several times during the progress of the difficulty seemed imminent, has given me no opportunity for either verifying or refuting. These refer to the possible origin of the abscess.

1. May the case from the outset not have been one of concealed "typhoid" with intestinal lesions and rupture of the walls, thus making a focal point in the abdominal tissues?

2. May not a wandering appendix, seeking rest and finding none in its normal territory, have migrated, Coxey-like, and pitched its tent on the other side of the anatomical Jordan?

Perhaps the most reasonable hypothesis is, that the unusual and violent exercise which the patient underwent just prior to his illness, kindled inflammatory action, eventually resulting in the formation of pus and ulcerating through into the intestine and ureter.

The literature of renal fistula, from causes other than traumatism, is exceedingly meager. Medical authors have little or nothing to say upon the subject, and reports of cases in current surgical journals are few and far between.

To the abdominal surgeon this case points a moral. That a man should have had an opening into his intestine and ureter, and voided faecal matter and urine vicariously therefrom for weeks, that he should have become reduced in weight from one hundred and twenty-five pounds to sixty and regain his normal health and resume his occupation, unaided by the surgeon's knife, is, even in our day of surgical surprises, unique.

WHAT IS FEVER, AND HOW IS IT BEST MANAGED?

By Henry F. Risch, M. D., of Kings County.

October 11, 1894.

Some members present will recollect that at about the close of our 1893 session I made some remarks on this same subject, but was not then prepared to read a paper on it.

Certainly fever is abnormally high temperature in the animal or human system; but before we speak of abnormal temperature let us consider what normal temperature is, and how it is produced and maintained at a certain standard.

How is animal heat produced? By oxidation, by hydration, and by motion. The nitrogenised food substances are oxidised into urea or uric acid, leaving the body with the urine, and taurocholic and glycocholic acids, leaving the body with the bile. Comparatively little heat is produced thereby. A much greater source of heat is the combination of hydrocarbons with oxygen; the carbon therefrom forming carbonic dioxide (CO_2). This reaction is generally considered the greatest source of heat, but there is a doubt within my mind about that. There has been for a long time a controversy among physiologists, whether water was produced in the animal organism; but what should become of the liberated hydrogen when its mate, the carbon, joins with the oxygen? It certainly then and there also, in most part, joins with oxygen, forming water, and must thereby necessarily produce the same amount of heat as so much hydrogen produces upon combining with oxygen outside of the body. By no other chemical combination is so much heat produced as by the junction of hydrogen and oxygen to form water.

Physiologists now agree that from one to two pounds of

water is produced in the human organism in twenty-four hours, which estimate may be still too small; but at that it gives us a great amount of heat.

Heat produced by hydration occurs principally in the stomach and alimentary canal during digestion; but probably also in the blood, in the tissues during assimilation, and also during retrograde metamorphosis. Another source of heat exists in all the other varied chemical changes going on in the body, and lastly by the mechanical friction produced by the circulation of the blood and lymph, and the motions of all organs and extremities. A sensible amount of heat is produced by the action of the glands on the blood; the blood leaving the glands warmer than it was when entering.

Having considered the source of heat we now come to the greatest wonder in nature, that is, the successful regulation of the bodily temperature at one certain standard, and there is no similar standard for anything else in the animal system. Yes, whether we are in a temperature of sixty degrees below zero Fahrenheit near the poles, whether we are in the temperate zone, or in the tropics, with the outside temperature very many degrees warmer than the normal temperature of our blood or our body, our system, while in health, will successfully, though labouriously, and with inconvenience, keep our body at the same standard temperature of about a degree below 100 Fahrenheit.

The maintenance of the bodily temperature in very cold weather is directly explained by the increased ingestion of food, and by the increased assimilation and oxidation of the same, especially the hydro-carbons. See how the Laplander drinks with delight oil in greater quantity than some of us drink water, and it is necessity with him; he has to supply his bodily stove with light burning material of the greatest heat giving power; and in order to oxidise it well he must force the draught by increased respiration and by increased activity generally.

The other extreme, that of keeping the bodily temperature below that of the surrounding atmosphere, though the

system must, in order to live, produce additional heat, is accomplished by keeping down the ingestion of food at a minimum; the digestion and assimilation at a still lower point. Respiration and oxidation are kept at the lowest degree possible. All the general bodily motions are performed with sluggishness and indolence, for which those persons living in hot climates must be pardoned, as increased activity means increased heat. Only one function is performed in excess of all others, that is perspiration that is the function which keeps the outside of our body wet with an almost watery fluid. Evaporation from the surface, by transforming a fluid into a vapour, needs a great deal of heat for its accomplishment, and being in apposition with the body takes the necessary heat from the body. The air in hot climates is generally dry, therefore evaporation goes on very rapidly; were their atmosphere at any time completely saturated, or nearly so, like we have it here very often, human life in the tropics would be impossible; they would all get a "physiological fever." Increased physiology, beyond wide limits generally, but here within very narrow limits, becomes pathology. This, besides an increased evaporation from the lungs by the expired air, and free drinking of cool drinks and the use of cool food substances, comprises all that nature can do to keep down temperature.

In an analogous way as they cool their own body they cool their drinking water in tropic climates. Keeping it in an unglazed earthen jar, where, percolating through the walls of the vessel, and thereby keeping the outside of it constantly wet in a perspiration, as it were, evaporation goes on constantly, cooling the water many degrees. Thus we see how nature accomplishes this great marvel in a very simple way.

So much for normal temperature. Subnormal temperature I shall not consider. This brings us then to hypernormal temperature, that is, fever.

We know that fever, besides the increased temperature, is attended with other variations from the normal standard. If these other variations did not exist, then there could not be

increased temperature, as the latter is one of the results of the former. Every fever is due to one of two conditions, either heat production is above par or heat abstraction is below par,—or the two conditions are working together. When one compensates for the lack or excess of the other, then still we have no fever.

What are the causes of excessive heat production? We must seek the cause in the nervous system which regulates it. We see throughout nature that ways and means are provided for self preservation under adverse conditions. This obtains when we become sick, when we become *diseased*, when the nervous system, instead of being *at ease*, becomes at *disease*, through something going wrong in the body. The nervous system then becomes differently affected, *i. e.*, irritated, and naturally reacts differently than under normal conditions. Then there is instituted a peculiar condition, with increased activity of the heart and lungs and resulting higher temperature, by which nature tries to correct matters, that is if the nervous system has not lost its power of control, either temporarily or permanently, by shock. This is called the reaction of the system, in other words, fever.

Thanks to the splendid discoveries of the last few years, we know that most of our diseases are due to foreign living organisms and their products within our body. We further know that such a heat as our body can possibly bear in way of fever is not able to kill off pathologic organisms. If such were the case we should endeavour to secure a sufficiently high temperature to kill them off at once. It is really too bad that this is not so, but unfortunately they live better and propagate better and more rapidly at the body's fever heat. This does not look like self-preservation; and still the organisms are killed off and their products are eliminated during fevers. Is it done by phagocytosis? Is it done by an increased oxidation process? By the micro-organisms themselves becoming oxidised? Or by some other process of which we are ignorant? The fact remains, it is in most cases accomplished during fever. If not accomplished, unless

the system acquires a tolerance to their existence, death must be the result. It is, as it were, a race between the micro-organisms and the activity of the system.

We all know that fever heat, especially when reaching 105°, 106°, 107°, or 108°, does great harm in the system; yes, the highest degrees of fever kill a patient very promptly. I have never seen a temperature above 108° (I have never seen it as high as 112°) without the controlling nervous system losing its influence and resulting in convulsions or coma, followed by death promptly.

Now what is the modus operandi by which high temperature hurts and kills? Let me here relate an experiment. S. S., a young man of twenty, contracted to keep his foot for twenty-four hours in water of 110° Fahrenheit. The temperature of the water did not vary one degree above or below. I had to cut short the experiment, for lo, in six and a half hours his foot was blistered. A number of days later we tried the other foot at a temperature of 108° and here the temperature did not rise at any time above 109¼°. In ten hours that foot was also blistered. The heat only acted on his foot from the outside, while he had cooler blood circulating within to mitigate the effect. How much more harm would the heat have done had his foot been like a sponge with fluid of these temperatures streaming through it.

When we have a fever temperature of 107° the radiators, —the blood vessels—like in a hot-water heating system, must be several degrees warmer, than the tissues heated thereby. How must the nervous system, the finest tissue of our body, suffer, and especially the brain, with its enormous vascular supply. So long as the nervous system performs the function of a "thermostat," so long the temperature of the body will not rise above 107°, or at most 108°, which seems to be the physical limit at which the body can exist without actually becoming burned or cooked by its own heat. Is it to be wondered at that cases of extreme high temperature are always either in a state of delirium, convulsions, or coma? I suppose you will agree with me, that a fever is in

most cases necessary for the system in order to overcome its hostile intruders, like defensive war, the fever excitement of a nation.

The fever is necessary, but the heat thereby produced is not, yes, it does great harm. A slight elevation of temperature affects in the first place the appetite and digestion. The higher temperatures, especially if long continued, hurt the nervous system, and weaken the heart, on which latter organ there is so much dependence during a fever, and the injury is probably by the pernicious effect of the heat upon the cardiac-ganglia. When weakness of the heart has set in, the blood cannot be propelled sufficiently through the capillary system of the skin, to set the sweat glands in action, or to heat the skin; consequently radiation of heat from the surface becomes almost *nil*. The internal temperature must rise, with accumulation of blood in the large blood vessels of the internal organs, interfering with their normal functions. Certainly those cases, where extremities and surface are cold, with a high internal temperature, are the most unpromising; unless the heart can promptly be roused by stimulants and food, and a prompt reduction of the internal temperature effected, life's chances are extremely small.

We have seen that super-normal temperature is harmful; yet it is necessarily produced by the acceleration of life's processes, which in turn are necessary to cope successfully with those hostile intruders. Now, what to do with this pernicious by-product, physically unavoidable? The answer to this question is practically, how is fever best managed? Certainly not by hampering the system in its efforts to overcome the trouble, but by encouraging it, and by leading off, and relieving the system of this harmful by-product, hyperpyrexia, and in that way giving the nervous system a chance, as it were, to let the horse go without the necessity of curbing constantly life's processes, for fear of overheating.

In the taking away heat from the body, we must take hints from Nature herself, how she manages this matter in health.

Nature wets the body in health by perspiration, but only those parts of the body which are too warm. Nature lets a person drink much water, cool, if he can get it, if he is not too warm inside. Nature propels the blood to the surface in order to set the sweat glands acting; also, by carrying more heat to the surface greatly increases direct radiation of the same. Therefore the maxim ought to be, never obstruct the access of heat to any part or surface of the body where there is subnormal or only normal warmth; but take it only from where it is in excess, either from the trunk or head, or if these surfaces are only normal or subnormal, and we have at the same time a high temperature in the rectum, let us then give our patient an internal bath of cool water by injection, and from above encourage cool drinking. The water injected, in quantity as much as can well be accommodated, ought to be retained long enough, say ten to thirty minutes, to allow it to get heated to near the temperature of the body. The water should at first be used with any notable chill off, but as it is well borne, the water may be used cooler. The injections are to be repeated, as each case demands, to keep the temperature down, either every two or three hours, or in extreme cases every half hour.

Heat abstraction from the outside should as much as possible be steady, best by putting only over the superheated surfaces a wet, thin pack, only a single layer of cheesecloth, or other thin material, constantly kept wet with water; or to insure the effect by something more volatile, as alcohol and water, or vinegar and water. This is certainly better than a cool bath; the patient is not disturbed, heat is only abstracted where necessary, the cloth is only sprinkled from time to time, the temperature of the sprinkling fluid should be warm enough not to awake the patient when sleeping, or to shock him when awake; the abstraction of heat is steady, and can easily be regulated by more or less wetting, or by using more or less volatile fluids; the extremities, if cold, can at the same time be warmed; by allowing a current of air over the surface, or by fanning, the effect can be still further increased.

By keeping thus the temperature down below 102° F., we find that our patient does not lose his appetite, but that appetite and digestion are frequently well maintained; much is taken, much is digested and assimilated, and in this way it is possible for a person to pass through a lengthy fever without losing much, if any, in weight. But in abstracting thus the heat, one is surprised how quickly it is reproduced—how many calorics must be abstracted—until the desired end is accomplished, then the fever drops, sometimes slowly, sometimes almost at once, but the natural time period of whichever essential fever it might have been, is very much shortened from what it would have been by allowing the process to go on at full speed. Thus I have now, for several years, treated a great variety of febrile conditions. Certainly I do not discard medication, where we can kill poisonous germs directly; or where we can otherwise aid the system, for instance by favouring the movement of the overheated blood to the surface, or by toning up the heart; as by small doses of quinine, for its general tonic effect, aconite to relax the capillary circulation, or Dover's powder for the same purpose, especially where also pain is a feature, strophantus, digitalis, strychnia, etc., when the heart—upon which so much depends —needs stimulation. Carbonate of ammonia, however, is the best cardiac stimulant on which we may depend in case of need, may any or all be indicated; but generally diminution of temperature with highest nutrition is the best support to the heart and the system in general. Antipyrine or antifebrine I never use for their antipyretic effects. In fact, I never use an antipyretic remedy. Alcohol I rarely use, and then only in fevers of short duration, where we hope to reach the crisis in a short time, and before the alcohol has, by exhausting the nerve power, done its harm.

As a conclusion, let me sum up in a few words the essence of my paper: Fever is a laudable process, and generally an effort on the part of the system to overcome and eliminate harmful substances, living or dead. Fever is produced by an acceleration of life's processes as regards retrograde meta-

morphosis. The constructive metamorphosis is, unless hyperpyrexia is kept down, seriously interfered with. That we should not hamper the system in its effort, but support it, and simply abstract that vicious, but unavoidable, by-product, hyperpyrexia; at least try to keep it down under that point where it will do harm to the tissues, and the nervous system in particular.

TETANUS NEONATORUM.

By J. Lewis Smith, M. D., New York County.

October 11, 1894.

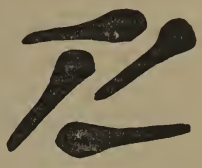
The disease designated tetanus is characterised by persistent tonic contractions of voluntary muscles, with short but painful exacerbations. The muscular contraction usually begins in the muscles of the neck and jaw, causing trismus, and it extends from them to the trunk and extremities. Tetanus, whether occurring in the neonati, in childhood, in adult life, or in animals, as the horse and sheep, produces similar symptoms and is the same disease.

AETIOLOGY.

Nicolaies, about the year 1884, produced tetanus by inoculating certain animals with particles of infected earth and later tetanus was produced in rabbits by inoculating them with pus from a patient with this disease. In November, 1886, Rosenbach obtained the same result in two guinea pigs by inserting under their skin small portions of gangrenous material from the ulcer of a patient having tetanus. He demonstrated the presence of a peculiar bacillus in the ulcer capable of causing tetanus. His experiment was repeated and confirmed by Bonomé and later by Hochinger, Varmé, and Giarre. Bonomé made observations on men, horses, and sheep. In the gangrenous wounds of three men injured by the fall of a church, and having tetanus, he discovered, among numerous micrococci obtained from their wounds, the constant presence of a slender, bristle like bacillus, readily stained with fuschin, and motionless. This bacillus, now admitted to be the common cause of tetanus, is twice or thrice as long as that of tuberculosis, thicker and straighter,

and slightly enlarged and rounded at one extremity. It has therefore been designated pin shaped or club shaped.

That this bacillus has its natural home in the soil is now admitted by bacteriologists. Prof. Wm. H. Welch, of Johns Hopkins university, in his address before the American Medical Association, June 28, 1889, said: "Among the pathogenic bacteria which have their natural home in the soil, the most widely distributed are the bacilli of malignant oedema and those of tetanus. I have," says he, "found some garden earth in Baltimore extremely rich in tetanus bacilli, so that the inoculation of animals in the laboratory with small bits of the earth rarely fails to produce tetanus."



The fact stated by Professor Welch, that the bacilli of tetanus have their natural home in the soil, throws light on many interesting observations which have been recorded in the literature of tetanus.

Lampiari[1] states that cultures of the specific microbe of tetanus in its complete development show a bacillus three or four millimeters in length and one millimeter in width, rarely curved or divided into small cylindrical fragments. Its spore is a large elliptical cell with two short filiform caudal prolongations.

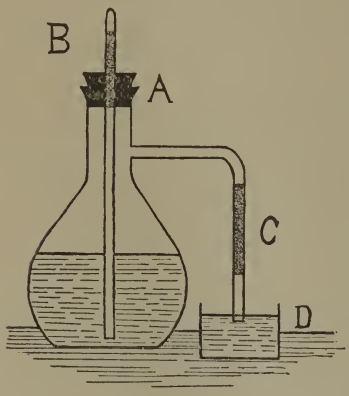
Brieger, by mixing the culture of the bacillus with the bouillon of sterilised meat, succeeded in isolating a toxine which he designated tetanin having the formula C_{13} H_{30} N_2 O_1. Injected under the skin this toxine produced in animals the same tetanic symptoms, which Nicolaies and Rosenbach observed in their experiments with the bacillus. The statement has therefore been made, based upon these experiments, that the bacillus is not itself the active pathogenic agent, but the toxine which it secretes, to wit: tetanin. This toxine resembles closely strychnine in its action, and separated from the bacillus by a proper filter, experimenters have found that it causes the characteristic tonic contractions, while the bac-

[1]Jour. des Societies de la France at L'etranger, November 11, 1888.

illi, deprived of the toxines which they secrete, lose their poisonous properties and are inert. Nicholas states[1] that he injected the filtered product or toxine of the tetanus bacillus into an animal and in the operation slightly scratched his hand with the point of the needle. Four days subsequently he had a typical attack of tetanus, from which he recovered. Brieger states that he extracted from the same cultures which furnished the tetanin two other poisons of great activity,—the tetano-toxique and spasmo-toxique,—the setting free of which was accompanied by a disengagement of sulphuretted hydrogen (Medical Chronicle, September, 1888).

Not only is the bacillus of tetanus widely distributed in impure soil, but it is especially abundant in the soil or dirt in and surrounding horse stables. Even the manure of such stables is especially rich in some cases in this bacillus so that according to reliable observers a little of the manure in contact with sores or wounds has caused tetanus.

An advance is made in our knowledge of the causation of tetanus by recent experiments published by Mr. Hewlett, demonstrator of bacteriology, in King's college.[2] The bacillus of tetanus he says may be grown in the following manner: "Yeast flasks of ninety cubic centimeters capacity are made use of, and are filled three quarters full with a two per cent. grape-sugar bouillon. The neck is corked with a perforated rubber cork through which a glass tube passes to the bottom of the flask and, projecting two inches above the rubber cork, is there plugged with cotton wool. The lateral tube from the side of the neck of the yeast flask, which is bent downward and extends nearly as low as the bottom of the flask, is also plugged with cotton wool, care be-



[1] Semaine Medicale, March 1893, p. 61.
[2] London Lancet, July, 1894.

ing taken that the plugs are loose enough to allow air to pass freely. The whole is sterilised and then inoculated. The glass tube which passes through the rubber cork is then connected with Kipps or other hydro-generating apparatus by means of a rubber tube and a current of hydrogen is passed through the flask, the hydrogen bubbles through the bouillon, and escapes by the lateral tube. After the gas has passed for about an hour a small cup containing mercury is applied to the end of the lateral branch so that the open end just dips below the surface of mercury, and the tube which passes through the rubber cork is sealed by the blow-pipe flame, care being taken that all the air has been expelled from the flask by a free current of hydrogen. The flask with the capsule of mercury applied to the end of the lateral branch, can then be placed in the incubator. Thus the mercury forms a valve; air cannot enter while gases formed by the growth of the organs have free exit." The writer gives some additional details to facilitate the chemical process. The discovery is very interesting and important that the specific bacillus of tetanus can be produced in the flask of the chemist and the mode of its production in an atmosphere of hydrogen devoid of oxygen shows that it is anaerobic.

Several years ago the prominent surgeons of New York connected with the Bellevue hospital noticed the fact that patients with surgical ailments coming from a certain part of Long Island, were very prone to have tetanus at the time or soon after admission into the hospital. This fact attracted much attention and was published in one or more of the medical journals. The investigations of recent years have explained the mystery, and shown that the soil in the infected portion of Long Island must have been "rich in the bacillus of tetanus."

The older physicians of the city remember that in the first years of their practice, that part of New York island now embraced in the Central Park and that portion lying between the park and the Hudson river were not sewered, and the streets embraced in this wide area were a dumping ground

for numerous shanties and tenement houses. I had the opportunity to observe the character of the diseases prevailing in these domiciles. Among the shanties were many horse stables, sometimes built against them, and from what we know of the close causal relation between the horse and its excrements on the one hand and tetanus on the other, it is not strange that this was one of the diseases which I had the opportunity to see. Tetanus, now so rare, was not an unusual disease in that part of New York island to which I have alluded, and I recollect that fatal tetanus neonatorum occurred in two infants of one family at an interval perhaps of eighteen months. Since the shanties and stables have been succeeded by clean and substantial houses with proper drainage and sewered streets free from refuse, tetanus both of infants and adults has according to my observations disappeared from the part of the city alluded to. There have been, and are, localities in every part of the known world where tetanus, especially of the newly born, has been so frequent as to sensibly retard the increase of population. In the beginning of the present century the attention of the profession was directed to the prevalence of tetanus in the Island of Heimacy, off the coast of Iceland. On this island scarcely an infant escaped, while on the mainland scarcely one was affected. Heimacy, the product of volcanic action, is of small extent and almost destitute of vegetation, and supports a scanty population. The inhabitants live chiefly on the flesh and eggs of the sea fowls, and are filthy and degraded in their habits. About the year 1810 the Danish government deputed the *land physicus* of Iceland to visit Heimacy, and ascertain the nature of the disease which was so destructive to the infants. Although this gentleman from his brief stay saw no case himself, he obtained interesting particulars in reference to the disease, from the priests and parents. At this time scarcely an infant escaped. Forty years later Dr. Schleisner reported that tetanus was still the most fatal of all the infantile maladies in Heimacy.

This disease is also represented as very fatal in the Island

of St. Kilda off the coast of Scotland. Heimacy and St. Kilda are nearly destitute of vegetation, but they contain large beds of guano, which is the principal fuel of the islands. The abundance of hydrogen and ammonia in guano would probably produce a good soil for growth of tetanus, and this fact affords a plausible explanation of the prevalence of tetanus in these islands.

In the town of Fulda in the beginning of the present century Dr. Schleisner states that he saw six cases in fourteen days, while a midwife in the same place declared that she had seen over sixty cases in nine years. In hot climates where the hygienic requirements are disregarded, tetanus is common. I have collected twelve monographs written by physicians who witnessed and examined with more or less minuteness tetanus neonatorum in the warm regions of America and chiefly in the filthy cabins of the slaves.

Though more than thirty years have elapsed since their records were made they exhibit remarkable unanimity in attributing the disease to the umbilicus and umbilical vessels. Thus Prof. T. A. Watson[1] in describing the new-born infant in the negro cabin says that the clothes around its hips, and often to its armpits, are soaked with urine. We find the umbilical dressing not only soaked with urine, but soiled with faeces. Sometimes the umbilicus is gangrenous and foetid. Where ammonia and hydrogen are produced so abundantly one would expect, as some of the writers state, that on certain of the plantations tetanus neonatorum prevents increase of the negro population.

Although most cases of tetanus neonatorum originate from the umbilicus and umbilical vessels yet in the infant as well as in the adult the specific bacillus and its toxine sometimes enter the system through a wound or abrasion of the surface. Thus Wallace[2] states that tetanus neonatorum often results from circumcision among the Jews and Mohammedans, in warm climates like India.

[1]N. O. Med. and Surg. Jour., May, 1846.
[2]Lond. Lanc., August 12, 1882.

UNCERTAIN CASES AND CASES OF UNCERTAIN ORIGIN.

Although the bacillus of tetanus is now regarded as the common cause of the disease, and in the newly born this microbe is known to develop in the umbilicus or umbilical vessels, or to be conveyed through them in the great majority of instances, nevertheless we must recollect that there are cases of more obscurity, and uncertainty as to their causation, than those which we have detailed above.

We will briefly relate cases of a kind, which is designated rheumatic, and also idiopathic by standard writers, cases which by some at least are supposed to be caused by exposure to cold and not by the specific bacillus or toxine.

Dr. C.[1] states that a miner, aged 28 years, sober and strong, was suddenly seized with tonic spasms, "evidently of a tetanic nature." He had opisthotonos, trismus, dilated pupils, slight risus sardonicus, and the countenance was distorted. Chloroform was inhaled until relaxation resulted. Then hydrate of chloral one drachm and bromide of potassium half a drachm were administered. By this treatment the tonic contractions gradually abated, the doses were diminished in frequency and quantity, and the disease ceased within a week. Dr. John Breen[2] writes of tetanus neonatorum:

"From dissections we have never been able to discover any peculiar appearance, which would justify us in offering any explanation of the pathology of the disease (tetanus neonatorum). In my own cases there was no evidence of disease of the umbilicus or umbilical vessels, so far as could be ascertained by external examination, and in one a careful post-mortem dissection disclosed no lesion of the cord."

A. C. Roper, of Exeter, relates the following case:

A highly nervous girl was thrown from her horse and sustained a lacerated wound of one hand, the abductor pollicis being cut through by a sharp stone. She was much afraid of lockjaw, but her fears were removed, and all went on well for four days, when her dread of the dis-

[1] London Lancet, July 14, 1894.
[2] Dublin Jour. of Med. and Chem. Sciences, 1836.

ease was revived by a friend's expression of anxiety to her on this account. Her fright was increased by reading the description of tetanus in Chamber's Encyclopaedia and soon after she declared that she could not open her mouth, and her neck was stiff. This rigidity continued five days without constitutional symptoms except extreme fright. She died on eighth day from the onset of the trismus and twelfth day from the injury.

The distinguished French surgeon, Nelaton, was requested to see a case of tetanus in one of the medical wards of the hospital to which he was a visiting surgeon. He sat a moment on the edge of the bed of the patient, but did not touch him or his dressing, and soon withdrew from the ward. He was then summoned to one of the surgical wards to attend a boy of eight years, who had been wounded by a vehicle in the street. Nelaton and his assistant washed their hands before visiting the patient, in a solution of corrosive sublimate. He then examined the wound and applied the internal dressing to it. The interne completed the dressing. Nevertheless, the boy without further exposure began on the eighth day to have lock-jaw, sardonic grin, and opisthotonos, but eventually recovered.

Dr. Joseph Clarke, physician to the Dublin Lying in Asylum, read a paper before the Royal Academy of Ireland, in which he stated that of 17,650 infants born before the year 1783, about one in six died within the first fortnight and in nineteen cases out of twenty the cause was tetanus. On account of this large mortality the number of beds in each ward was diminished, and the ventilation improved by apertures made in the ceilings, windows, and doors. Immediately the mortality in the first two weeks was diminished to about one in nineteen, and continued reduced in subsequent years. At a later period W. Evory Kennedy had charge of the same asylum and was so impressed with the benefit conferred on the human race by Dr. Clarke, by reducing the mortality caused by tetanus neonatorum, that he wrote, "If we except Dr. Jenner, I know of no physician who has so far benefited his species, making the actual calculation of human life saved, the criterion of his improvements." It will be observed that

Dr. Clarke makes no mention of the umbilicus. The tetanus neonatorum from being common, became comparatively infrequent, by increasing the ventilation of the wards and diminishing the number of beds and probably also by improved sanitation in the care of the wards, bedding, and patients.

Dr. P. C. Gaillard[1] relates the following case:

> The nurse returned in the evening with wet apron and clothes, and the baby sneezed three or four times. The tetanus began at 10 p. m.

In certain localities in Europe, where there are no parish churches, the frequent occurrence of tetanus in the newly born, has been attributed to wet and cold in carrying babies to distant churches to be christened. In the Island of Cayenne, in a hamlet surrounded by mountains and a dense forest, tetanus attacked one in every twelve of the new-born infants. After a great part of the forests had been cut down so as to allow access to the cold sea winds almost all the newly-born infants died of lockjaw. (Insel Cayenne).

Bonomé states that seventy persons were injured by the fall of a church from an earthquake. The old crumbling wall produced dust and debris, and nine of those injured had tetanus at the usual time after the accident, with eight deaths.

The following case is reported from the Foochoo Native Hospital of Southern China, September 28, 1887:

> A crushed and gangrenous toe was amputated, and tetanus began on the following day, and was fatal. S., aged 31 years, was admitted into the same hospital, October 8, having internal hemorrhoids and on October 10 was placed in the same ward which the tetanic patient had occupied, and the hemorrhoids were operated on. October 19 he returned home cured. On the following day, October 20, he reappeared with tetanus of which he died.

The physician who reports the cases says, tetanus is not common in southern China and he considered it certain that the first case communicated the second.

Richelot[2] has related two cases, the second of which appar-

[1] Southern Jour. of Med. and Pharm., September, 1846.
[2] La Semaine Medicale, September, 1880.

ently resulted from the first. Both occurred in the Tenon Hospital. In the first case tetanus followed an operation for the removal of the ovaries and Fallopian tubes, and was fatal. The second case, also laparotomy, was more simple than the preceding, but on the seventh day fatal tetanus occurred. The room in which all laparotomies were performed had been well disinfected with sulphur and the walls washed with carbolic acid, but in midsummer, twenty days before the first laparotomy, manure had been thrown over the flower beds, and the casual relation of the horse manure, containing as it often does the bacillus of tetanus as is known to bacteriologists, seems manifest. No explanation could be given of the causation of these two cases of tetanus except the free use of the horse manure upon the grass plots and flower beds of the hospital.

But the prevailing belief before the discovery of the tetanus bacillus, that exposure to cold is a common factor in causing tetanus, especially in those that are wounded, deserves consideration. The exposure to wet and cold of wounded soldiers is an alleged cause of tetanus. But in some of these cases the soil upon which the wounded lie may be rich in the bacilli so as to infect the wounds. But it seems probable from the number of cases cited, that cold is to a certain degree a causal factor though less than has been supposed. But how do we explain the aetiology of cases like the following alluded to by Gowers, who writes, "Many cases have been recorded which commenced within forty-eight hours after the injury, a few within twelve hours, and one or two in which tetanus came on almost immediately." In Robinson's often quoted case, "a negro who cut his hand with a piece of porcelain was dead in fifteen minutes." In such cases it is improbable that there is time for the growth of the bacillus, the formation of its toxine, or for the operation of cold or temperature variations, but we must attribute the tetanus to nerve irritation and the explosive action of the central cells from which the affected nerves originated.

Tessier[1] relates the following case: The gangrenous toe of a patient was amputated, and the patient free from tetanic symptoms previously, stated that the muscles of his jaw contracted during the operation. In two days death occurred from tetanus. A slight increase in the irritation of the nerves from the operation so affected the central nerve cells, already excited by the disease, that fatal tetanus was soon developed. In view of these observations varying from each other my conviction is strong that the time is approaching, and is not far distant, when the bacillus of tetanus will be considered the cause of this disease in endemic, epidemic, and most cases of single tetanus, and cases having another origin will constitute a small variety. Perhaps the same distinction will be made as in diphtheria, the term true tetanus being applied to the disease when caused by the bacillus, and the term pseudo-tetanus used to designate cases having another origin.

[1]Gazette des Hospital, 1874.

BRIEF COMMENTS ON THE MATERIA MEDICA, PHARMACY, AND THERAPEUTICS OF THE YEAR ENDING OCTOBER 1, 1894.

By E. H. Squibb, M. D., of Kings County.

Read by title October 9, 1894.

From the character of the correspondence received by the writer during the past year, it seems advisable to repeat the introductory remarks made here three years ago, when this series of comments was begun.

The aim of the following brief commentary has been, and still is, simply to give a short, compact digest of the prominent current literature of the professions of medicine and pharmacy. There has been no attempt at treating the subject exhaustively, in the way of noticing every article that has been written upon, but an effort has been made to sift the great accumulation of matter presented during each year, and give points of general information which may be of service to a busy practitioner who is supposed to be interested, and yet is unable to give the time to even hurriedly skim over the literature in order to keep abreast of the times.

Acetanilid (antifebrin) has now surely gained a permanent place in the physician's armamentarium, and gives excellent promise of being equally efficient in the surgeon's hands. Based on the good results obtained by Dr. Francis W. Harrell, of Gilman, Wash., who obtained such markedly beneficial effects when used as a dressing for wounds, Dr. G. A. Bodamer has made a more extensive use of it in the surgical dispensary of the German hospital, Philadelphia, Penn., and Dr. Charles H. Castle in the accident ward of the Cincinnati hospital, Cincinnati, O. Dr. Harrell used it in "a great number of burns, scalds, contused and lacerated wounds, into which coal-dust, ashes, iron-filings, grease, and dirt of every kind have been thoroughly ground. . . . ." He

"treated similar injuries with iodoform, boric acid, carbolic acid solutions, and with bichlorid solutions and gauze," but he has "never succeeded in curing them without the formation of pus." He goes on to state: "Since I have used acetanilid in the treatment of every case I have had in which there was extensive loss of tissue, and in every case it has acted well, the usual result being no pus and rapid recovery. I have not been able to use it in any major operations, as fortunately we have had no very severe accidents here for the last two months. My method of treatment has been cleanliness, with the application of finely powdered acetanilid to the wound. Apply plenty of it; in fact, for a crushed finger I make a bed of acetanilid." He concludes by stating that he finds "acetanilid a dry dressing that does not scald the skin, as does boric acid; does not have an offensive odour, as does iodoform; will never poison by absorption, as does sometimes carbolic acid or mercuric chlorid solution, or gauze."[1]

Dr. Bodamer completely corroborates Dr. Harrell's statements, and even goes further in his expressions of satisfaction. He states that "in the large number of cases of this description (many of which come from Baldwin's Locomotive Works), in which acetanilid was employed, not one was suppurated. Thus, healing takes place in a short time, and it is often possible, without keeping the men away from work much longer, to save half of a phalanx, when amputation formerly would have been practised." He has used it "in his private practice, applied to mucous patches, having the patient hold the mouth open for several minutes while the powder was applied. The effect has been remarkable, the patches clearing very rapidly. He also used it in a case of ulceration of the rectum, in which malignancy was feared, and prompt healing followed. In a bone case which had persisted for some time, he secured healing by the use of acetanilid while the patient was confined to bed by an attack of influenza. In one sinus case, the acetanilid was injected in a watery mixture, and after a few hours profuse sweating occurred, and the patient experienced a rather pleasant sensation as of floating in the air." . . . "As its toxic effects have only followed the internal administration of excessively large doses, it is improbable that enough could be absorbed, after being dissolved in the discharges of a wound, to produce unpleasant effects, unless injected in large quantities in sinuses. In this respect iodoform and acetanilid are on a par. As a desiccant, the latter is far superior; the dryness of the wounds in all cases hav-

[1] Phila. Medical News, vol. lxiii, p. 438.

ing been remarkable, the acetanilid being found as a thick, dry crust over the wound at the second dressing. As regards expense, acetanilid can be procured at one tenth the cost of iodoform."[1]

Dr. Castle has used it successfully "in dressing fifty-one scalp wounds, and two hundred and seven other wounds and solutions of continuity." With his present experience, he "would say that it is an efficient antiseptic, stimulant, non-irritating, non-toxic, odourless, clean, easy to wash from the surface of a wound and the surrounding skin, desiccant, and to a certain extent a hemostatic."[2]

Its use in veterinary practice has met with equal success. Dr. M. E. Knowles, of Hamilton, Mont., has obtained "most happy" results in the veterinary hospital of Bitter Root stock farm. "The first case in which it was given a trial was certainly a crucial test —it was upon an extensive fistula of the superior cervical region ('poll-evil') of long standing in a Percheron colt four years old, which had been exsected about ten days previous . . . ." It "was then suppurating very profusely from the entire wound-surface, about ten inches in length, and from two to six inches in depth. The wound was carefully washed with a 50 per cent. solution of hydrogen dioxid, and packed thoroughly with acetanilid. The following day there were not two drams of pus in the cavity, and at the termination of a week hardly a drop of pus could be discovered. The entire wound healed kindly fifteen days from the commencement of the acetanilid dressing. I have since used acetanilid after dissecting out three fistulas of the superior scapular region ('withers'), in one of which immediate union was obtained; in the remaining two slight suppuration continued for a few days only. In all I have used acetanilid in about twenty-five surgical cases, with the happiest results; in fact, in all my minor surgical cases only ordinary antiseptic precautions in cleanliness and the acetanilid dressing have resulted in healing by first intention, a result in veterinary surgery otherwise difficult for me to obtain, even under most thorough preparation and scrupulous cleanliness."[3]

Finally Medical Inspector G. W. Woods, U. S. N., stationed at Mare Island, Cal., read a paper at the recent annual meeting of the American Medical Association in San Francisco, on "The Use of this Agent in Medicine and Surgery." His experience was

[1] Phila. Medical News, vol. lxiv, p. 269.
[2] Phila. Medical News, vol. lxiv, p. 363.
[3] Phila. Medical News, vol. lxiv, p. 419.

"confined to twenty cases of lacerated wounds and operations, and the list embraces some new experiences and applications of this remedy." He gives an interesting clinical history of two important cases and concludes by stating that this agent "should be welcomed to the outfit of all surgeons, but especially to those of the army and navy." . . . as being specially adapted "to the field and campaign work of the former, and similar duty in connection with landing parties and shore duty of the latter; in time of war, its application to all wounds being soothing, beneficial, avoiding the necessity of immediate, careful antiseptic, cleansing, and permitting of delay in completing the final surgical attention, in most cases a delay often as necessary as desirable on shipboard, on account of the rolling of the ship or stress of weather."[1]

Acid Acetic. Some interesting work has been done during the past year with the expectation of applying this acid to the rendering of fat and to the treatment of garbage. Its antiseptic property is taken advantage of in preventing the decomposition of the fat or garbage at the point of production, and the penetrative power of the acid is utilised when the organic matter is brought to the rendering house and put in contact with a greater volume of acetic acid. Acetic acid at a temperature equal to the melting point of fat releases the fat from the tissue with such ease that not only is the full yield of fat obtained, but by reason of the comparatively low temperature the fat is of a very light colour, comparatively free from the acids of decomposition and practically free from acetic acid. From its purity the fat thus obtained is in proper condition for the manufacture of glycerine or other substances of which the fat is the chief ingredient.

Acid Carbolic (phenol) still continues to occupy the attention of chemists as well as the medical profession. An interesting series of experiments was completed within the past year by Mr. Charles A. Kohn, Ph. D., B. Sc. of University College, Liverpool, England, on the causes of the colouration of this acid. He made his report at the Nottingham meeting of the British Association last year. He apparently gives good ground for disputing most of E. Fabini's conclusions mentioned here on a previous occasion. He employed very carefully distilled and purified acid and subjected it to the various agents which have been known to cause the colouration, each by itself, with uniformly positive results, whereas the pure acid free from moisture and air was not changed. He makes the following interesting statements: "Of greater im-

[1] Journ. of Amer. Med. Assoc., vol. xxiii, p. 100.

portance than the action of these various reagents upon purified phenol, is the fact that the pure product obtained by each of the above processes does of itself become coloured when exposed to ordinary moist air. The colouration, which gradually deepens from pale pink or brown to red, is always accompanied by the absorption of moisture, and the reddening is especially conspicuous in the partially liquefied parts of the sample. This colouration does not take place in the dark, nor under red glass; it is the work of the more refrangible rays of light only.

"As has often been observed, sublimed phenol does not redden as rapidly as the distilled product; in fact, according to Bidet, it does not colour at all on exposure when thus purified. This, however, is not the case. The sublimed product becomes coloured quite as quickly as distilled phenol when in solution, and that it is slower in turning pink when in the solid state is due to the fact that the crystals obtained by sublimation are less hygroscopic than the distilled product. In absence of moisture, under all conditions, no colouration ensues; hence the appearance of the colour in those portions of the sample which have become partially liquefied. Phenol, placed *in vacuo*, can be exposed to light for months without becoming red, nor does it colour either in presence of moisture when air is absent, or in presence of air when perfectly dry. Both air and moisture are necessary for the colouration to take place."

Bearing on the subject of the use of this acid in typhoid fever alluded to here, last year, Surgeon R. H. Quill, of the British Army Medical Staff, reports, on "The Use of a Combination of Carbolic Acid and Chloroform in Enteric Fever." The prescription for the mixture contains five ingredients, one of them little known in this country and therefore it is not repeated here. Suffice it to say that the proportion of acid to spirit of chloroform is 3 to 10, and the whole is made up to 355 Cc. (about 12 f $\frac{z}{3}$). The report requires reading in full to derive sufficient intelligible understanding to follow the course pursued, but the following may be quoted here: "The combination of carbolic acid and chloroform was adopted for the following reasons: In 1892, Dr. McIntire, of Glasgow, conducted some experiments in regard to the action of carbolic acid on the enteric bacillus (Gaffky's), and found that in addition to an antiseptic action on the intestinal contents, the acid controlled the development of the enteric bacillus. Previously to this, in 1890, Werner, of St. Petersburg, made similar experiments with chloroform, and found that a $\frac{1}{2}$ per cent. solution of chloroform killed

the enteric bacillus. Reflecting on these experiments it occurred to me that a combination of these drugs, both of which had a distinctive effect on the specific micro-organism of enteric fever, and one of which had as well a wholesome intestinal antiseptic action, ought, if given with judicious freedom, to be effectual in rendering immune the enteric bacillus and its septic products. So far, my expectation has been realised. I have treated with the carbolic acid and chloroform combination during the past year all the cases of enteric fever that have come under my care, and in each case perfect recovery has followed, without the advent of any symptom calculated to cause anxiety. It is a gratifying experience to be able to make this record regarding a fever, which, in India, has a mortality very considerably higher than that usually experienced in temperate climates."[1]

At a meeting of the Clinical Society of London, England, on February 23d last, Dr. Wilberforce Smith showed a case of phthisis in which a successful result had followed the inhalation of carbolic acid. The patient was a man twenty-five years old, who presented signs of dullness together with moist sounds at the apex of one lung. His temperature was high and there was also a fistula in ano. He went to St. Leonards, where he lived under good hygienic conditions, and he used a large inhaler, made from an ordinary hat box, in which flannel charged with carbolic acid was suspended. He continued these inhalations for eighteen months.

Dr. Thomas A. Elder of Aurora, Ill., has met with marked success in the treatment of itching in three cases of small-pox, with an ointment consisting "of a mixture of one part of crystallised carbolic acid and three parts of camphor, with from three to five parts of vaseline."[2]

Dr. S. W. S. Toms, of Bellport, N. Y., not only confirms Dr. Elder's experience, but calls attention to the fact that he was the first to bring the subject before the profession at an earlier date.

Acid Picric (tri-nitro-phenol) has been chiefly used in a saturated aqueous solution as a delicate test for albumen, and the picrates have been employed as a medicine to some extent, but with indifferent success; however, the report now comes that the acid has been used for some time past in the Paris Charity hospital in the treatment of burns, with some success. The method originated with M. Filleul, and Dr. Thièry introduced it in the hospital. The

[1] Brit. Med. Journ., vol. i, for 1894, p. 909.
[2] N. Y. Med. Journ., vol. lix, p. 534.

method is to saturate lint with a ½ per cent. solution of the acid and wring it out well before applying it to the burn. In ordinary cases, it is only necessary to change the dressing every three days at first, and afterwards every four or five. The acid appears to act best when allowed to dry on the lint as applied to the burn without protecting with oiled silk or other impervious covering. It acts as an anaesthetic as well as an antiseptic. Apparently no irritation of the skin occurs, and erysipelas has never followed its use. The most marked objection found to it is the persistent yellow stain left where it has been applied.

Agathin (salicyl-aldehyde-α-methyl-phenyl-hydrazone) — the analgesic—continues to be used in Great Britain and on the Continent to some extent in the treatment of sciatica, neuralgia, and some forms of rheumatism, but practically nothing has appeared in medical literature for the past year.

Algine is a mucilaginous substance, resembling gum arabic, and obtained from the red algae or Laminaria stenophylla and Laminaria digitata. It is prepared by treating sea-weed with a boiling sodium carbonate solution, which dissolves the alginic acid in the form of sodium alginate, leaving the cellular tissue as a residue. This salt treated with hydrochloric acid throws down the alginic acid as an amber-coloured gelatinous precipitate. This is separated by means of a filter-press, again dissolved in sodium carbonate solution and evaporated down to a thick consistence, after which it is dried at a moderate heat.

It is very similar to gelatin, but it differs by not coagulating to a jelly, and by not being precipitated by tannin. It differs from albumen by not being coagulated by heat. It differs from gum arabic because it is precipitated from its solutions in an insoluble state by the mineral acids. It forms soluble salts with the alkalies. Its solutions are very viscid, being fourteen times greater than starch and thirty-seven times greater than gum arabic. It may be well used to emulsify oils and clarify wines. Other uses will readily suggest themselves.

Alphol (α-naphtyl salicylate) is a new internal antiseptic of an isomeric form to betol. Whereas, in the formation of the latter β-naphtol is used, in alphol it is α-naphtol. Sodium-salicylate, sodium α-naphtolate, and phosphorus oxychloride are mixed and heat applied to a temperature of 120° to 130° C. (248° to 266° F.). After further treatment and purification it is presented in a form resembling betol. There seems to be little need for this new article as it is said to resemble salol and betol in its therapeutic

effects, but it has been given in doses of ½ to 2 grammes (about 7½ to 31 grains) internally in articular rheumatism, some forms of cystitis, and as a general internal antiseptic with good results. It is reported to split up into α–naphtol and salicylic acid when it reaches the intestinal and pancreatic secretions.

Alumnol, the astringent and antiseptic, is still used largely, but with varied success. Although Caspar and Sander are skeptical as to its use in gonorrhoea, and even in chronic cases prefer silver nitrate, still others hold differently. Dr. William S. Gottheil, of New York city, has made a preliminary report on its use in skin diseases. He employed it in sixteen cases of acute inflammations of the skin and vesicular, impetiginous, and diffuse eczemata of the face, head, extremities, and general surface; nine cases of chronic inflammations of the skin and squamous indurated and seborrhoeal eczemata; nine cases of superficial and deep-seated syphilitic inflammations of the skin, and gummata of the skin and subcutaneous tissue; nine cases of deep-seated or parenchymatous and traumatic and infectious inflammation of the skin; eight cases of parasitic and contagious diseases of the skin; seven cases of glandular and vascular diseases, and finally two of gonorrhoea. He concludes that "The number of cases of gonorrhoea were not sufficient to draw any conclusions from, but I think the drug deserves trial in chronic cases. It will probably be found about as efficacious and reliable as the other remedies used, or as unreliable. The truth probably lies midway betwen Chotzen's eulogies and Caspar's report of its uselessness."[1]

Dr. J. A. Cantrell is satisfied as to its usefulness in erythema intertrigo, acute vesicular eczema, and other forms of eczema.

Drs. R. Heinz and A. Liebrecht still believe in its action in both superficial and deep cavities.

Dr. Albert Spengler, of Heidelberg, Germany, apparently continues to use it in preference to zinc chloride.

Professor Schwimmer, of Buda-Pesth, Hungary, reported at the recent International Medical Congress, held at Rome in April, that he obtained excellent results. In acute cases, at times, irritation occurred, but in chronic cases none appeared. He found, however, that the treatment had to be kept up fully as long with this agent as with others.

Aminol is a new antiseptic and deodoriser in the form of a gas, introduced within the past year. It is presented for use in the form of solution of the gas, which latter is obtained by the action

[1] N. Y. Med. Journ., vol. viii, p. 532.

of lime upon some of the *amine* compounds. It is said to occur in the flowers of the hawthorne and pear tree, but is also found in the natural decomposition of nitrogenous vegetable and animal matter. It is found in commercial quantities in the brine in which herring have been cured. An English firm is introducing it, and they call attention to the fact that it is being used successfully in combination with lime as the basis of the process for the purification of sewage at Wimbledon, England. Two solutions are offered, both alkaline, and of a disagreeable, shrimp-like odour. One is recommended for general disinfection, and the other for gargles, injections, and surgical dressings. The difference between the two solutions is not explained, but may be that of strength only. Dr. Klein and others have apparently used at least one of the solutions, for they evidently vouch for the new article, but nothing has been reported in the journals upon its use as yet.

Analgen (ortho-oxy-ethyl-ana-mono-benzoyl-amido-quinoline)—the analgesic—has been little written upon during the past year.

Antidiphtherin is prepared by Prof. Edwin Klebs at Carlsruhe, Germany, from cultures of the bacilli of diphtheria. He has used it, apparently, in two different strengths successfully in thirteen cases, which results no doubt must be accepted as trustworthy as far as they go, coming from such authority; but others, attempting to repeat his successes, have been disappointed.

Dr. Kunne, of Vienna, Austria, made use of it in four cases of diphtheria in the Elberfeld hospital, with varying success. Two of these were children with moderately high fever and some false membranes on the tonsils. A 5 per cent. solution of this agent was at once applied, and repeated three or four times a day. On the very next day the fever had subsided, and the membranes had disappeared. The third case was a very severe one, with an abundance of membranes. As tracheotomy had to be performed, a 1 per cent. solution had to be dropped into the trachea through the cannula. No benefit was derived, and the child died from extension of the membranes into the bronchi. The fourth case was one of the medical staff of the hospital, who had contracted the disease at a tracheotomy. In this case the applications were begun early—just as soon as any membranes were seen—and the effect seemed to be favourable at first, but soon the membranes increased, and spread over the palate and uvula, and at the time this report was made the result of the case was doubtful.

Dr. V. G. Grigorieff, of Prof. N. T. Filatoff's clinic in Moscow, Russia, employed it in four cases of diphtheria in children, and

came to the conclusion that the remedy is worthless. In spite of the paintings, repeated three times a day, false membranes continued to spread steadily, and the fever remained high, and even increased.

Finally Dr. Oscar Vulpius tested it therapeutically with at least 50 per cent. of deaths, so that the future of this treatment with Klebs's material does not look very promising.

Antipyonin is the odd name adopted for a new antiseptic to be used by the ophthalmologist and aurist. It was brought into notice by Dr. Rolland, of Toulouse, at the French Congress of Ophthalmology held in Paris last May. He described it as sodium tetraborate, obtained by dissolving equal parts of borax and boric acid in boiling water and allowing the new salt to crystalise out. It is a readily soluble white unctuous powder without causticity or toxic effects. Dr. Rolland had employed it for the past three years to the exclusion of all other antiseptics in treating cases of keratitis and conjunctivitis, and he declares that there is no medicinal substance that compares with it in respect to the number, ease, and rapidity of the cures produced, as it appears to prevent the development of the pyrogenic elements either on the surface of the eye or in its cavity.

Antipyrin (phenazone). Last January the Therapeutic Committee of the British Medical Association made its full report on "An Inquiry Regarding the Importance of Ill-Effects Following the Use of Antipyrin, Antifebrin, and Phenacetin." Last year the preliminary report was quoted here under the heading Phenacetin, and this report now made is simply the full and complete one to go on record in *British Medical Journal* (Vol. I for 1894, page 85), and is interesting reading.

Most users have noted the peculiar liability to erythematous eruptions, and some attribute this to the idiosyncrasy of the patient, independent of dose, but the evidence is not conclusive. It is remarked that in migraine patients the patches curiously appear in exactly the same places.

Nothing new is found to report.

Antirheumatin is another one of those mixtures which has no legitimate reason for its existence as such. The name was proposed by Kamm, and is brought forward by a Dr. Fischer. It is a compound of methylene blue and sodium salicylate. It is presented in a prismatic crystaline form of a dark blue colour and readily soluble in water. It colours the urine either a blue or green, depending upon the degree of oxidation. Its name is a

sufficient index of its use, and is recommended in small doses in pills containing three to six milligrammes ($\frac{1}{20}$ to $\frac{1}{10}$ of a grain) given every two or three hours. It has no claimed advantages over its two components separately.

Antispasmin has received little attention in the current medical literature of the year. It was natural to expect that some observers would take up the work of Prof. R. Demme, of Berne, Switzerland, where he left it at his death, and although only one report has appeared in print, still investigations may be going on—the results to follow later. From the early investigations remarkable results were expected. Apparently the only observer reporting is Dr. S. Rabow, who verifies the investigations already made, and concludes that in general it appears to possess similar properties to morphine, except in degree—being as much as forty to fifty times weaker.

Antitoxin is a word frequently used now throughout the medical profession all over the world, and for what it stands, and of the benefits expected and promised from treatment, with the various forms, all are no doubt interested to learn. Although this agitation is very recent, and everything reported is rather tentative as yet, still the literature, especially in Europe, is already very voluminous, and it would be futile and surely tiresome to attempt to even enumerate the reports made through the journals up to date. It is, however, timely to give here a short running account of that antitoxin used in the treatment of diphtheria. The first step in the practical application of the process of obtaining it "is the preparation of the diphtheria toxin from cultivations of the specific bacillus of the disease. Flasks containing nutrient broth are inoculated with the bacilli, and maintained for several weeks at a temperature of 37° C. At the expiration of this period of incubation the contents of the flasks are filtered through a Chamberland filter, which arrests the bacilli. An illustrated description of this filter, as employed by d'Arsonval, will be found in the *Pharm. Journ. and Trans.*, Vol. XXIII, page 1034. The clear filtrate thus freed from organisms has a strong alkaline reaction. It is a virulent poison, and speedily causes death when injected into animals in comparatively small quantities; from this property it is called diphtheritic toxin. The toxin is injected into animals in minute, but increasing quantities, at intervals extending over some months, the initial doses being so small as to cause only transient symptoms, and it is found that animals so treated are finally enabled to withstand the injection of such doses as would prove rap-

idly fatal to an uninoculated animal of the same weight. When the animal has been thus rendered immune its milk and blood serum are stated to possess the remarkable property of protecting other animals from inoculation by the disease. In order to obtain the serum, blood is withdrawn from the body and allowed to stand. It clots in a short time, the clot being composed of filaments of fibrin enclosing the blood corpuscles, and by the contraction of the clot the blood is separated into clot and serum, the latter being a pale, clear fluid, comprising practically the fluid part of blood, *minus* corpuscles and fibrin. The serum obtained in this way, from the blood of animals rendered immune, as previously described, constitutes the 'antitoxin' used in the treatment of the disease, the name being derived from its antagonistic action to the 'toxin' produced by the bacillus. It may be well to state here that nothing is known at present as to the nature of the substance to which the action of the toxin and antitoxin is due. From experiments on animals the following results were obtained:—(1) By mixing the antitoxin in certain proportions with the toxin in a test-tube the latter is rendered harmless; (2) by first injecting the antitoxin, followed by the toxin, the same effect is produced; and (3) the toxin may be injected first, followed by the antitoxin; in this case a relatively larger quantity of antitoxin is required, and the interval between the injections must be brief.

The serum, in most of the cases reported, was obtained from the horse. The animal is rendered immune by repeated injection over a period of two or three months, at the expiration of which its serum possesses very high anti-toxic properties. The animal suffers in health but slightly, if at all, and the operation of bleeding may be repeated two or three weeks after being first performed. It is even said to be possible, with this animal rendered immune as previously described, to withdraw about a kilo of blood at once, and to repeat this from time to time without any deterioration of the antitoxin obtained or danger to the animal, provided the injections of toxin be continued in the intervals between the blood-letting operations. The dog, goat, and sheep have also been employed, but the blood of the horse furnishes a more abundant and clearer serum than that of the other animals mentioned.[1] The animals used are cab, carriage, or draught horses, sound in constitution, but broken down in limb, who, after inoculation, live a life of ease and luxury, varied by a periodical phlebotomy, such as our grandfathers submitted to voluntarily two or three times a year."

[1] Pharm. Jour. and Trans., vol. xxv, p. 291.

It is to be confidently hoped that another tuberculin overestimation may not be the result of this prospective boon to the whole world. There is such great danger of going too fast in our zealous desire for something new, and the very evident hankering after notoriety, that a premature announcement of successes based on an inadequate and incomplete experience cannot be too strongly deprecated, especially on account of the retarding effect often produced by such action, even in a good cause. Although unsuccessful cases have been reported, still, happily, complete success has attended its use in diphtheria in a very large proportion of cases, and the whole world is looking on anxiously for the final verdict.

Aronsohn's and Behring's antitoxins are the ones now most largely used, and from which by far the best results have been obtained.

Apiol, in the liquid form, has considerably revived in use in Great Britain since last alluding to it here; but little is heard of it in this country. Mr. Lewis Ough, FCS., of Leicester, England, has been called upon to prepare it in rather large quantities —100-pound lots of seed used—and, therefore, he has thought it opportune to give his method of preparing it: "The freshly powdered seeds are thoroughly damped with spirit (s. g. 0.838), packed in a percolator, and, after standing forty-eight hours, percolation is continued with spirit, one half gallon being used to every pound of seeds taken. The bulk of spirit is recovered from the bright green alcoholic liquor by distillation, and the remainder driven off in an open vessel by means of a water-bath. The residue, on cooling, deposits a quantity of a waxy-looking solid, from which apiol is readily separated, as a dark green oily-looking liquid, with a specific gravity of 1.036; the yield being about 7.5 per cent."[1]

Aristol (annidalin) received little attention in medical literature last year, although its use is quite on the increase, and its favourable action in suitable cases is now too well known to need any comment here.

Asaprol (calcium β-naphtol-α-mono-sulphonate) has been little written upon during the year past, and appears to be rather on the decline in medical practice.

Benzol (benzene) has been used with good effect by Dr. Wm. Robertson, of Newcastle-on-Tyne, England, in the treatment of influenza. He gives a brief clinical record of six of his recent cases, and explains as follows: "At the outset of the treatment, one or two blue pills, as the case demanded, were given, but

[1]Chem. and Drug., vol. xlv, p. 17.

beyond this absolute reliance was placed on the benzol. Its exhibition in mucilage, along with a few drops of spirits of wine and spirits of chloroform, was found the most convenient. To render it as palatable as possible it was given in a little lemonade. In no single case given in this way was it found to cause any gastric irritation. I have discarded the use of capsules containing it. Administered in this way it does impair the appetite, and gives rise to unpleasant eructations. Administered in mucilage, it has not been found to interfere with due nutrition. Producing, as it does, in nearly every case, such a rapid defervescence of the symptoms of influenza, as is to be expected, the usual sequelae of the attacks are rarely or never noticed. Debility after this form of treatment is hardly appreciable by the patient. In one case before treatment, pain in the ears, along with the other symptoms, was promptly relieved. In this case otherwise treated an acute catarrh of the middle ear might have been a probable event. In old and young alike the treatment proves efficacious, and it seems to act as efficaciously in debilitated as in robust subjects. Very few pulmonary complications have been noted in cases presenting themselves within the last few weeks, but it might be inferred that a remedy which so suddenly relieves the grave initial symptoms lessens the probability of pulmonary complications becoming established."[1]

Dr. A. Da Sacco, an Italian practitioner, has met with success in applications by means of a brush of a mixture of one to six of tincture of iodine and benzol, to diphtheritic membranes. Three applications should give improvement, and in three days complete dissolution of the membranes.

Dr. T. N. Kelynack, of Manchester, England, reports a fatal case of acute poisoning. He points out that benzene acts chiefly as a narcotic, and death takes place slowly, due to cardiac failure.

Dr. Rosenthal, of Magdeburg, Prussia, reports a case of poisoning of an 18-months' old child, who had swallowed 15 grammes (about ½ an ounce) of the commercial article. The case was not fatal, owing to rapid treatment, including washing out the stomach. The child remained in a sleepy condition for six hours. Dr. Rosenthal calls attention to the fact that glove cleaners at times produce the narcotic effects upon themselves by inhaling it, for their own gratification.

Benzonaphtol (β-naphtol benzoate)—the intestinal antiseptic and competitor of betol—has not been reported on in the current

[1] Brit. Med. Jour., vol. ii for 1893, p. 1425.

medical literature of the year past, but this is not a sign that it has been abandoned by any means, for it is surely largely used very successfully.

Benzosol (benzoyl guaiacol) is still used in the treatment of pulmonary tuberculosis, but with little reported upon it. Its use in diabetes mellitus, however, is more general, although reports are conflicting. Palma, of Berlin, refutes Piatkowski's favourable results alluded to here last year. He reports on six cases with little evidence of its usefulness, and advises caution in its administration, as it often at first produces diarrhoea, which may become alarming in cachectic cases.

Betol (naphtosalol or β–napthol salicylate) has gradually fallen into disuse, principally for the reason that its competitor, salol, has proved to be superior.

Betula Alba (the common European white birch) is mentioned here simply to call attention to the fact as a matter of interest, that the oil (oleum rusci) obtained by the dry distillation of the birch bark, is now produced in much increased quantities, not for the treatment of skin affections, for which it still has a limited use, but for giving that characteristic odour of Russia leather to the fashionable shoes now growing in popularity and cheapness. The oil of cade, which it closely resembles, if it is not identical with it in the way of medicinal properties, no doubt supplies the limited demand now that the oleum rusci has been diverted from its therapeutic uses.

Borax (sodium borate) in the treatment of epilepsy, although not new by any means, has lately been brought more into prominence by its successful use in certain cases. Dr. Edward A. Welch, B. S., of Sutton, Mass., has made a careful study of the published literature of this article, as he found little satisfaction in what the reference books presented. He now gives the clinical history of one successful case which he had treated with 650 milligramme (about ten grain) doses. The patient, at the time of presenting herself, had decided evidences of bromism from the use of potassium bromide, and this had to be eliminated before beginning the sodium borate treatment. Attention is to be drawn particularly to the fact that no improvement was noted for the first nine days, after which, however, progress was rapid. This study is well worth perusal, and will be found in the *New York Medical Journal*, Vol. LVIII, page 626.

Prolonged use of this salt is not as free from inconveniences as one would imagine from its hitherto supposed harmless character,

for Dr. Ch. Féré stated in the French Biological Society on December 9, last, that he had observed cutaneous sequelae following its use, principally seborrheic eczema of the scalp. Loss of hair occurs, which, however, grows again after this treatment is abandoned.

Bromal Hydrate is an anologue to chloral hydrate, and although not new, has been brought into notice again by Dr. B. W. Richardson, of London, England. The dose is about one half that of chloral hydrate and the after effects, in many cases, are milder in form. Little is heard of it generally, however, which may be due to the difficulties experienced in procuring it pure.

Bromamide—the antipyretic—has received practically no attention in the medical literature of the year, and evidently Dr. Augustus Caillé has not had the opportunity he hoped for last year to extend his interesting observations, for no printed report has been found of his results.

Bromoform is still used in the treatment of the insane, as recommended by Dr. G. Angrisani, of Italy (alluded to here last year).

Although Dr. L. Rambaud, of Paris, France, at that time and since then obtained favourable results in acute mania, he totally failed in chronic cases, but has had very gratifying results in a case of spinal epilepsy, which had lasted a whole night at times, and which would not respond to such remedies as the bromides and the antispasmodics generally.

Its use in the treatment of pertussis still far outranks its other uses. Pellicer deems it the most serviceable of all remedies. He believes most of the failures have come from not increasing the initial dose.

Dr. H. B. Carpenter, of Philadelphia, Penn., reports both successes and failures in pertussis, and believes the good effect to be due, at least partly, to its action as a local anaesthetic on the pharyngo–laryngeal mucous membrane. Small doses have not produced bad effects, but large ones have caused stupour, drowsiness, and at times narcosis, but the patient was easily restored.

Dr. Carpenter, with others, has reported poison cases, and caution is still strongly urged.

Bromo-Phenol (ortho-bromo-phenol) has been practically unheard of in the medical literature of the past year, and if its apparent success in the treatment of erysipelas, alluded to here last year, has been repeated, it has not been reported through the usual channels.

Butyl-Chloral Hydrate (often erroneously called croton-chloral) has not appeared in the medical literature of the year.

Butyl-Hypnal—the compound formed by the combination of butyl-chloral and antipyrin—has apparently not been followed up therapeutically, as was hoped for at this time last year, for no printed reports are to be found.

Calcium Sulphide has apparently been little recognised as a remedial agent, but it evidently deserves some attention, and although astonishing results can not be looked for, still success has followed its use frequently enough to warrant conservative practitioners making a study of its action. Dr. T. M. Lloyd, of Brooklyn, N. Y., reports that he has "employed the remedy in about twenty cases of measles and scarlet fever in private practice, in conjunction with defervescents. The results pointed to an amelioration and to an apparent abridgement of the duration of the fever. In pertussis, in a few cases, the paroxysms were markedly reduced in number and severity within two or three days of its administration, where just previously they were becoming more severe. In a number of other cases the results were not so positive, but, though the type was sufficiently severe, none developed extreme conditions. Most of the observations were made upon young children. The administration should be frequent—hourly or half hourly. Half a grain, half hourly, was given to children between two and five years. When given in an agreeable form it was seldom objected to."

The writer confirms the above results in pertussis, as his own three children were treated with this agent during an attack of each child, one after the other, last spring. The children's ages were about one, four, and nine. The dose was made up into powders with milk sugar, which was not only not objected to, but was looked forward to. Occasionally slight eructations of sulphuretted hydrogen were noticed, but the odour was not persistent enough to be objectionable.

Camphor has recently been under discussion again as to its true constitution. Mr. C. Gillet is not satisfied with the present explanation of its composition. By the action of alkalies or acids on acetone (CH_3–CO–CH_3) he produces two forms of a condensation product of acetone called phorone, or what has been obtained by Chautard and called camphrene, differing only from camphor in molecular structure by the absence of the radical CH_2. Mr. Gillet claims that camphor (C_{10} H_{16} O) is a phorone (C_9 H_{14} O) with the radical CH_3 replacing one atom of hydrogen. He obtains a crystalline substance of the same physical appearance and odour as cam-

phor by the condensation of two molecules of acetone and one of methyl acetone.

Castoreum has recently been studied by two French chemists, MM. Beauregard and Pilliet, who find that the explanation of its source, so long accepted and taught, needs some modification. The glands in the groin of the beaver now appear to be simply extensions of the prepuce in globular form, which is lined with villiform epithelium. Each of these innumerable villi are covered with smaller and smaller projections, one upon the other to form a papillary structure, and the castor found there is simply the sebaceous secretion in the form of the stratified pavement epithelium of this structure.

Chloralamid (chloral formamide) is still held in favour as a reliable agent in the treatment of idiopathic insomnia. The medical profession all over the world now appears to accept this remedy as one of permanent value. The most written upon it during the past year has been in relation to its effectiveness in seasickness. Results vary somewhat, but according to reports much benefit has been obtained. Some disappointment has been met at times, but it has been pointed out that all the functions of the body must be in normal working order to obtain satisfactory results. This is so self-evident under any condition that it would seem as if such a precaution would naturally be followed. However, constipation has been known to bring on subsequent vomiting after the first dose had been effective, which a free movement of the bowels immediately checked. Thus it seems necessary to emphasise here the universal principle that regular habits must be maintained.

Dr. Marcus offers the following formula for administration to children in acute infectious disease:

Chloralamid	1.30	grammes	(about	20 grains)
Solution of Ammon. Acetate	16.00	"	"	247 "
Simple Syrup	30.00	"	"	463 "
Water	60.00	"	"	2 ounces

Dose for a child three years old, five grammes (about eighty grains) every four hours.

Dr. M. H. Lackersteen, of Chicago, Ill., relates a case of a large overdose—140 grains—being borne by a patient, which may interest some to read.[1]

Chloralose (anhydro-gluco-choral), the new hypnotic of last year made from anhydrous chloral and dry glucose, has received marked

[1] Phila. Medical News, vol. lxiii, p. 616.

attention during the past year, and much satisfaction has been found in its use by many. The increased doses which it was gradually found to be necessary to produce the best results have emphasised the fact that it is not the perfectly harmless agent it was at first claimed to be, for cases of poisoning are multiplying.

In the Children's hospital, Dr. F. Gordon Morrill, of Boston, Mass., has "prescribed it in twenty cases of insomnia, with good results in almost every instance," and goes on to state that "in simple insomnia it certainly 'acts like a charm,' and is destined, I think, to replace chloralamid, than which drug it is more reliable." He gives an account of several of his cases, and concludes: "The results which I have thus far obtained certainly encourage me to persevere in giving this hypnotic a more thorough trial. It is as certain in its action as chloral, and far safer; as harmless as chloralamid, and far surer, so far as I have been able to observe."[1]

Dr. C. Rossi has tested it in 250 cases of both sexes, in the lunatic asylum, embracing cases of mental diseases of the most varied forms where insomnia was present. It was administered both in the day and night time. In the day time it was not satisfactory, usually producing only drowsiness, but at night it almost always induced sleep in less than an hour and a half, lasting a longer or shorter time according to the idiosyncrasy of the patient and the size of the dose. It appeared to be most active in those forms of insanity attended with depression, and least active in those showing any excitement. The sleep produced was quiet, but not usually very deep. Although the information is rather untrustworthy from this class of patients, the after-effects do not appear to be unpleasant.

Dr. J. Ohmjelewski has tried it in 17 cases of mental diseases, including simple and periodical mania, senile dementia, etc., and concludes that it is a valuable remedy in these cases, and especially useful where chloral and sulphonal are contra-indicated.

Cappelletti, of Italy, has recently carried on experiments with this agent on frogs, rabbits, dogs, and men, the latter being asylum patients suffering from insomnia; it produced, as a rule, calm sleep of six or seven hours, with a commencing dose of 200 milligrammes (about 3 grains), but the dose necessary varied with the patient. In slight insomnia, rarely over 400 milligrammes (about 6 grains) was needed, but in severe cases, 800 milligrammes to 1.2 grammes (about 12 to 18 grains) were called for. Hysterical patients were found especially susceptible. The larger doses often produced

[1] Boston Med. and Surg. Jour., vol. cxxix, p. 492.

convulsive attacks without sleep. It was found to be particularly effective when given in the evening. The sense of touch and pain, as well as the pulse, respiration, and temperature, remain unaltered. It appears to have little effect on the initial trouble causing the insomnia. Finally, he found that it is not eliminated through the urine undecomposed.

Dr. E. Chambard, of Bourges, France, has also made a study of it. He has seen a case of somnambulism which occurred under its use. He classes it as an almost certain hypnotic, but variable in action at times; as not being an analgesic, giving less satisfaction in insomnia due to pain, and in alcoholic insomnia its effect was only moderately good. It appears to have a soothing effect in some affections of the central and peripheral nervous system. It has been found of value in some cases to diagnose hysteria, as manifestations appear under its action. He has noticed it aggravate the incoördination of locomotor ataxia and the tremour in paralysis agitans. In conclusion, he finds it particularly applicable in cardio-vascular affections, even in their asystolic stage.

In confirming by experiment the observations of others as to its hypnotic effects, Dr. J. Sacaze, of Montpelier, France, discovered its property of diminishing the night-sweats of consumptives. With a few exceptions, both the insomnia and the night-sweats were greatly relieved. In some cases the diaphoresis was practically stopped. In the few cases where the relief was only slight, it appears to act badly in all ways, giving evidence of idiosyncrasy of those patients. Dr. Sacaze concludes that it is well worth being considered equally with such agents as atropine, ergot, and the like in relieving the two very prominent symptoms of pulmonary tuberculosis, insomnia, and excessive diaphoresis.

Mr. Charles Flemming, M. R. C. S., of Freshford, near Bath, England, corroborates as a whole the above observers. He extended his observations over eleven months and relates fifteen cases in which he met with success, and also enumerates the ten cases in which it was useless. He finds that, "In the early stages of Bright's disease, chloral hydrate, owing to its effect on the blood pressure, is probably more efficient." He concludes with the following timely remarks: "I have tried to mark plainly the limits to the use of this hypnotic, to save it, if possible, from the worst curse of a new drug—that of becoming a fashionable favourite, and, like other fashionable favourites, having to heal all things and all men, with a success that is more commercially profitable than therapeutically useful. I cannot help thinking that we may have in chloralose a

practically pure hypnotic, that is, a drug of which the dose that is sufficient to produce sleep affects the psychical element directly and solely."[1]

Chlorobrom (equal parts of chloralamid and potassium bromide) in solution is still reported as an efficient combination in sea-sickness. Dr. Charteris, of Glasgow, Scotland, reports 100 cases of successful use in the second stage of sea-sickness.

Dr. John A. Boyd, of the same city, corroborates the above, and lays particular stress on avoiding constipation as a prerequisite to successful results.

Dr. J. Alfred Masters, M. R. C. P., of Kensington, London, W., England, relates a case of its value in persistent vomiting not arising from sea-sickness.[2]

Chloroform as an anaesthetic is still a prominent subject of discussion throughout the medical profession, and particularly in Great Britain.

Drs. R. Anschütz, of Bonn, Prussia, A. Schmidt, and a few others still maintain that there is a difference in purity when made by certain methods. The first two recommend that that only should be used which has been prepared from salicylid-chloroform. Salicylid is simply salicylic acid minus the water radicle, known as the anhydride of salicylic acid, and it forms a crystalline compound with chloroform. From this compound pure chloroform is obtained by distillation. They report a large number of successful administrations with this chloroform. However this may be, a larger proportion of observers claim very decidedly, and with good and sufficient reason, that there is no discoverable difference between chloroform made from different substances, or by different processes, provided they be properly purified by well known methods.

Dr. Clinton B. Herrick, of Troy, N. Y., has made very gratifying use of the following anaesthetic formula, which he introduced from Vienna in 1887, and his successful administrations, both in private and hospital practice, now run up into the thousands :

Ether, U. S. P.	11	parts by weight.
Absolute alcohol, U. S. P. . . .	12	" "
Chloroform, U. S. P.	77	" "

Other practitioners in his neighbourhood confirm his results. Esmarch's inhaler is used with certain precautions.

[1] London Practitioner, vol. liii, p. 8.
[2] London Lancet, vol. ii for 1893, p. 1217.

Dr. Warholm reports many good results from the use of the vapours of weak acetic acid in controlling the vomiting attending the administration of chloroform. Prolonged inhalations are without disagreeable effects when the vapours are inhaled from the acid poured upon a towel, and much benefit is derived.

In a recent debate on the inhalation of chloroform, Dr. T. Lauder Brunton made the interesting suggestion that death might be favoured by toxins in the blood which were absorbed from the alimentary canal. He referred to experiments made by a Russian investigator on the alkaloids found in the urine, as being an index to trouble with the anaesthetic, and to the well recognised fact that many of the fatal cases occurred after accidents in robust men living chiefly on a meat diet. He also referred to the geographical distribution of the fatal cases as being infrequent in localities where the diet was mainly vegetable. The large increase of deaths in recent years in Great Britain is attributed to the increase of meat-eaters, due to the scarcity of and the lack of taste for vegetables, and also the decreased cost now of meats by the large importations from the United States—Chicago dressed beef is a household article now in Great Britain. Gout has increased in frequency as might be expected.

Chlorol is the unfortunate and confusing name given by some French enthusiast for notoriety to a mixture to be used as an external disinfectant. It consists of:

Corrosive mercuric chloride	1 part.
Sodium chloride	1 "
Hydrochloric acid	1 "
Copper sulphate	3 "
Distilled water	1,000 "

He takes the precaution in this mixture to make it complex for the purpose of rendering it less harmful in case of accidental swallowing by adding the copper sulphate to produce emesis, and the acid to prevent decomposition of the mercuric chloride in the presence of the albuminoids. The common salt is added to promote stability of the solution.

However effective this mixture may be, the above name should not be accepted for reasons too plain to be alluded to here, but some such name as *Disinfecting fluid for external use only* should be chosen.

Chlor-Phenols—Para and ortho-chlorphenol (derivatives of carbolic acid)—in both these forms have been employed to an in-

creased extent in Russia during the past year. Dr. N. P. Simanovsky, professor of laryngology at the Military Academy of Medicine in St. Petersburg, has used 5 to 20 per cent. solutions in glycerine locally in tuberculosis and other diseases, and draws attention to the fact that irritation of the mucous membrane does not occur even with the stronger solution. The cases treated were for the most part quite advanced with serious affections of the throat, impairment of the voice, and difficulty in swallowing. All the cases improved rapidly after treatment. Only a few applications were found necessary in chronic thickening and hyperplasia of the mucous membrane to produce like favourable results. He believes them especially applicable in diphtheria, and in all laryngological practice would prefer them to iodoform, pyoktanin, menthol, and the like—particularly as they also possess anaesthetic properties.

On the other hand Professor Szmurlo, of Warsaw, obtains greatly different results. He tried one of them in 26 cases of affections of the nose and throat, 10 of hypertrophied turbinated bones, and others. In 5 cases of laryngeal tuberculosis in the form of ulcers, with infiltrations, he painted the parts with a 25 to 50 per cent. solution. His conclusions were as follows:

1. It does not possess the analgesic properties of carbolic acid, while its very repulsive odour and taste stand most decidedly against it in his branch of the profession.

2. It is much inferior to chromic acid and the galvanocautery, for the reason that its local application destroys the epithelial lining, and causes such pronounced reaction that often suppuration supervenes, and at times hypertrophied tissues result.

3. It is prone to cause local oedema in cases of laryngeal tuberculosis and acute, persistent pain, even after the use of cocaine, accompanied by loss of appetite and a weak and nervous condition.

It would appear then, in these cases, that it was very much inferior to lactic acid, carbolic acid, or menthol, and possibly entirely useless.

Dr. J. A. Tchourilow, of the Alexandrovsky Hospital in St. Petersburg, has recently recommended this agent in the treatment of erysipelas, using ointments of one, two, and three per cent. strengths. He claims a cure of the whole of twenty-five cases, in varying periods, from the second to the eighth day after application.

Dr. A. Elsenberg, in charge of the venereal and skin wards of the Jewish Hospital in Warsaw, has met with very encouraging results in the treatment of lupus. The effects were similar to those

of Koch's tuberculin, but none of the dangers of the latter were encountered. He used an ointment of equal parts of

Parachlorphenol,
Lanolin,
Vaselin, and
Powdered starch,

and apparently effectually produced cicatrisation of the ulcerations and destruction of the nodules, and prevented the spread of new centres; but as far as effecting a permanent cure of the lupus he has not gone, although he once succeeded in obtaining an approximately complete cure.

Cocaine. Cocaine phenate (phenol-cocaine) or so-called cocaine carbolate, alluded to here last year as being on the increase in use, has been practically unnoticed in the medical literature during the past year. It gave promise last year of being quite prominent, but apparently no one has thought well of reporting further on its use.

Cocaine, and its salt, the hydrochlorate, of course, are largely used with great benefit. A new method of using this anaesthetic locally for its analgesic effects has been brought forward by Dr. A. Krogius, who has used it with success in two hundred minor operations. The method is based on the recognised fact that a two per cent. solution of the hydrochlorate injected into subcutaneous tissue in the neighbourhood of a nerve trunk, not only produces its effect immediately about the region of puncture, but over the entire zone occupied by the peripheral distribution of that nerve. In order to obtain analgesic effects over as large a sphere as possible, Dr. Krogius thrusts his needle gradually through the parts transversely to the long axis of the member to be treated (the finger for instance), and permits the solution to be discharged as the needle progresses. In the course of about ten minutes he produces analgesia in the whole member, including the skin, tendons, periosteum, and deep parts, and it will be maintained for at least a quarter of an hour.

One or two transverse injections at the wrist will produce analgesia of a large part of the palm of the hand.

By injecting over the ulnar nerve at the back of the elbow, the whole ulnar side of the hand as far as the roots of the last two fingers may be rendered analgesic.

An injection over both supra-orbital notches may produce analgesia over the whole of the middle portion of the forehead.

Creolin (liquor antisepticus), the coal-tar product reported here last year as being simply a mixture of about one part of resin soap, with two parts of crude carbolic acid, of about twenty per cent. strength, is still being used in a limited way, but does not show any marked advantages over carbolic acid.

A report comes from China even, where two cases of leprosy were treated with modified success; and the conclusion drawn is, that the disease can at least be checked, but not as yet cured.

Creosotal (so-called creosote carbonate) is still being used as an efficient substitute for the simple beechwood creosote in pulmonary tuberculosis, as being well borne by the stomach and with a tendency to increase rather than decrease the appetite. It is known to have been used during the year to some extent in this country but little has been reported on it.

Creosote has received considerable attention during the year past in the treatment of pulmonary complaints, and the literature is voluminous. Opinions still differ widely, but nothing has been brought forth as yet to refute the effectiveness of the long recognised conditions of good hygienic surroundings (including altitude, whereby pure air is obtained), a proper attention to diet, regular, systematic, muscular exercise, frequent bathing, brisk rubbing down, and due regard for the regular functional habits.

Professors A. Bèhal and E. Choay have recently reported their results of the quantitative composition of the creosote obtained from the beech and from the oak. The former is richer in guaiacol and has a greater density. It also contains a smaller percentage of monophenols, which render it less caustic than the oak product.

Rectal administration appears to be gaining in favour.

Cryostase is merely mentioned here as somewhat of a curiosity, being a new compound discovered recently by a German chemist. It is remarkable for the heretofore unknown property of solidifying when heated and returning to a liquid form when cooled below zero Fahrenheit. It consists of a mixture of equal parts of carbolic acid, camphor, and the proximate principle known as saponin (obtained from the root of saponaria officinalis or soapwort), together with a smaller portion of spirit of turpentine. Although albumen and some other bodies harden when heated, they do not return to the liquid form when cooled, and therefore cryostase stands alone in this particular. Nothing has been discovered as yet as to any other peculiar properties it may have, and no application for it is now in view, as it is still a physical phenomenon.

Dermatol (bismuth subgallate) is still a prominent agent in the

medical world. Its external probably outrank its internal uses, but efforts have been made to bring it forward as of marked service in the treatment of dyspepsia. Sufficient time has not yet elapsed for further reports to be made on this use.

The courts now have it in hand to settle the authority by which the patent office granted exclusive rights for a preparation which many claim was made long before the date of issuing the patent.

During the past year, its external use has produced an occasional annoying dermatitis.

Very recently Dr. J. Abbott Cantrell, of Philadelphia, Penn., published rather unfavourable comments upon it. He claims that it is not superior to other iodoform substitutes; it does not check but rather increases discharges; it is decidedly irritating; it is a stimulant rather than an astringent, and finally it does not fulfill the claims made for it.

Diapththerin (oxy-chin-aseptol)—the antiseptic and astringent agent which continues to be used principally in Europe—does not seem to attract much attention here. The most that is reported comes from abroad.

Dr. C. Steinmetz finds that a 1 per cent. solution acts principally as an efficient deodoriser, and exhibits no particular advantage over other antiseptics. A 50 per cent. ointment, however, makes an efficient caustic which gives no pain. He suggests its application in diphtheritic lesions. It has the unfortunate property of colouring the hands and nails yellow, and steel instruments are affected.

Prof. Stabel has found by a series of experiments that this agent excels lysol and carbolic acid in arresting the development of micro-organisms, and in killing spores. After exposing anthrax spores to a 15 per cent. solution for three days, all power of growth was destroyed. He cannot find that any definite amount produces poisonous effects in animals or man. He seems to claim better antiseptic effects than Dr. Steinmetz.

Diaphthol (chin-aseptol) is a new internal antiseptic compound particularly applicable to the genito-urinary tract, and brought forward by Professor L. Guinard at the last November (29th) meeting of the Lyons (France) Society of Medical Sciences. This name has been proposed for it on account of its close analogy to diaphtherin (oxy-chin-aseptol) last mentioned. It is acid in its affinities, forming diaphtholates, in which form its activity is increased. Experiments were almost wholly confined to animals, and little has been done with it clinically as yet. It occurs in yellowish white crys-

tals slightly soluble in cold, but to a greater extent in boiling, water. It apparently acts better than salol, is practically free from toxic properties, and is eliminated by the kidneys unchanged. The process of manufacture has not been given in detail. Further reports are expected.

Di-Iodoform is the name given by two Frenchmen, MM. Maquenne and Taine, to a compound which has similar physiological properties to iodoform, but without its disagreeable odour—practically odourless. Its name is derived from the fact that it may theoretically be considered as a condensation of two molecules of iodoform, after losing two molecules of hydriodic acid, to form the chemical salt carbon di-iodide (di-iodoform). It contains 95.38 per cent. of iodine, very nearly as much as iodoform, and will keep indefinitely when not exposed to the light. Light decomposes it, liberating iodine. It is seen in powder form when ready for use, but it crystallises in yellow prismatic needles in distinction from the iodoform scales. It is insoluble in water, slightly soluble in alcohol and ether, but readily in chloroform. The mode of preparation is explained technically and is of little profit here. Dr. Adrian called attention to the above researches at a meeting of the Paris Therapeutical Society on November 8 last, which gave the opportunity for Dr. Hallopeau to state that he was then engaged in a series of investigations on its therapeutical action in the dermatological wards of the Hôpital Saint Louis. He has already found that as favourable results were obtained with this agent as with iodoform in the treatment of soft chancres. Both he and Dr. Brodier reported to the society their results in treating twelve cases of simple chancre, and they draw the following conclusions: It may be used exactly like iodoform; it usually cures in from eighteen to twenty days; neither pain nor irritation is experienced; it has no odour if kept away from light and air; it may act like iodoform in not curing cases of phagedenic chancre; applications should be made several times a day; it is best to keep the ulcer spread with absorbent cotton well saturated with it; in general it is well used in all suppurations where iodoform has been applied successfully.

Its cost has largely stood in the way of its general use in this country.

Diuretin (sodio-theobromine salicylate) apparently fell off considerably in use during the year in Germany, but as the German pharmacopoeia finally thought well enough of it to admit it to its

"addenda," it may become more prominent again. In this country it is still well known.

Professor Ancona calls attention to a previously unnoticed action. It has heretofore always been administered for dropsy and effusions accompanying cardiac affections. Its action has been variously explained, by some as directly, and by others as indirectly, on the heart, while again, others deny any action whatever on that organ. It has been considered as both a direct and indirect diuretic, and finally its action has been located in the renal epithelium as a stimulant simply, whereas, now Professor Ancona claims that its effect is simply that of regulating the stimulus to micturate, for he gave it to a patient with chronic progressive spinal paralysis in which there were marked disturbances of the ability to micturate, which was repeatedly overcome by daily doses of from 2 to 4.5 grammes (about 30 to 75 grains). He finds it difficult to think that it could have acted through either the heart or kidneys, for there was no sign pointing in that direction. He rather inclines to the opinion that it acts directly on the vesical centre.

Dr. E. Main calls attention to the previously observed fact that it should not be administered to children under the age of eighteen months, as it is prone to produce digestive disturbances and gastro-intestinal irritation.

Dr. B. W. Richardson, of England, now feels called upon to modify his first impressions of this agent in that he finds great variability in its action and is led to the same conclusion Dr. H. A. Hare, of Philadelphia, Penn., arrived at, that great care must be observed in eliminating the action of other agencies when drawing conclusions. He at times noticed the inconvenient symptoms of headache, depression, slight fever, somnolency or mild delirium, requiring suspension of administration, at least for a time.

Dulcin (para-phenetol carbamide), the synthetic sweetening compound alluded to here last year, has been investigated still further, and the present reports are more conflicting than a year ago as to its harmlessness. Professor Aldehoff has found that its effects on dogs in daily 1 gramme (about 15 grain) doses is not as harmless as at first reported, for his animals died in three weeks with symptoms of acute jaundice.

On the other hand, Professor Kobert, of Dorpat, Russia, has found that although the evidence in dogs is somewhat conflicting, in rabbits this agent is harmless. Cats seem to stand well as large doses as would be given to man. He favours its use in small repeated doses. He mentions the case of a patient who took 8

grammes (about 2 drachms) daily for three weeks, with no ill-effects.

It appears to be an advance on saccharin, on account of its sweeter taste, and is reasonably safe in small repeated doses.

Ethyl bromide (hydrobromic ether) is still used very largely, particularly in short operations, to which class of cases it should be strictly confined. It is surely a very convenient and rapid anaesthetic, but the warning repeated here for the past three years is apparently still as much called for as ever, for fatal cases are by no means rare, and in all the cases reported care was taken to eliminate the impure article.

In 1892 Professor Terrier called the attention of the Paris Chirurgical Society to the favourable results obtained by the successive use of this agent and chloroform, and at a meeting of the Congress of Russian Medical Men, held in January last, Prof. E. Pavlow, of St. Petersburg, Russia, called attention to the fact that he had employed a mixture of the two since 1891. He concludes, after using it in some hundreds of cases, that the mixture should be preferred to pure chloroform as an anaesthetic.

In France, where it appears to be most largely used, opinions differ considerably among careful observers.

Ethyl chloride (mono-chlor-ethane) is still used successfully as an analgesic, both in this country and abroad, particularly in opening abscesses, felons, and the like; but very little has been written upon it during the past year.

Eucalypteol (eucalyptene bichloride), the new antiseptic of last year obtained from eucalyptus oil, has apparently been heard from only through the manufacturer's advertising, for no reports can be found in the current medical literature of the two continents in regard to it.

Eucalyptol, as alluded to here last year, is now officinal; but little has been reported upon it during the past year. It is still in prominent use, however, and no doubt its application is now taken as a matter of course.

Euphorin (phenyl-urethane), the aniline product, used as an antipyretic, has not been written upon during the year past. Dr. G. Cao's favourable report, alluded to here last year, has apparently not acted as an incentive to others to report on it, if it has been used at all.

Europhen (iso-butyl-ortho cresoliodide), the iodoform substitute, containing 27.6 per cent. of iodine, is still in use in the form of powder and of an ointment.

Dr. Gilbert of Paris, France, reports that although he had been somewhat of a skeptic, determined to look into its efficiency, and is now enabled to recommend that it should be tried. He finds it possesses no decided poisonous properties, and gives the best results in treating varicose and other ulcers by alternating the use of the powder and a 1 to 5 per cent. ointment. He fortunately obtained results in some cases which did not previously respond to iodoform, silver nitrate, etc.

Professors A. Offelein and J. Neuberger, of Nuremberg, Bavaria, report that they found that all kinds of wounds healed quickly after using this agent in the 200 cases under their care. They used the powder and a 3 to 5 per cent. ointment.

Exalgin (methyl-acetanilid)—the analgesic—continues to receive attention, and to give favourable results, although not free from the dangers repeatedly pointed out.

Dr. Thomas D. Savill, of Upper Berkely street, London W., England, has employed it in a certain number of suitable cases in the Paddington infirmary. He reports: "I have used it, not so much as a curative agent in neuralgia and allied disorders of the nervous system as in the endeavour to relieve the pain associated with various chronic maladies. An agent which will enable the medical man to relieve even where he cannot hope to cure, is necessarily one of great value, and the mitigation of pain is a thing which the patient looks to him to effect perhaps even more than the ultimate cure of the affection." Detailed notes of his twelve cases are of interest and will be found in the London *Lancet*, Vol. II, for 1893, page 1304. He summarises by stating: "It will be seen that in all the cases the symptom for which exalgin was administered was pain, varying, as the notes have shown, in position, constancy, character, and intensity. In many of the cases it was situated in the head, and was of a more or less neuralgic character. In four cases the pain complained of was in the hips, and in only two of these was any improvement noted. In the other cases the pain was referred to the skin, corresponding more or less with the distribution of a particular sensory nerve."

". . . With regard to tolerance, it was noted that in six of the cases where the cause of the pain was persistent, the dose had to be increased, and exalgin did not seem to be altogether free from the disadvantages that attend the use of all drugs of this class, viz., the necessity to increase the dose or to change the remedy from time to time. It may be mentioned that all these cases had been

in the infirmary for some time, so that their relief could not be due simply to their improved surroundings.

I think one is justified in anticipating that in exalgin there exists a valuable analgesic specially adapted to relieve pains of a neuralgic type, being prompt and efficacious in its action, and without any of the deleterious after-effects observable in some of the other drugs belonging to the same chemical group, but of which the dose requires to be occasionally increased if the drug is continued for a long period."

At a meeting of the Paris Academy of Medicine on April 24 last, Dr. Dujardin-Beaumetz called attention to the fact that in his opinion the too-prevalent dose of 500 milligrammes (about 7½ grains) was entirely too large, and sufficient care is not used in its general application. He maintains that the dose should never exceed 250 milligrammes (about 4 grains).

Owing to the very slight solubility of this agent—being 1 in 48—its proposed use hypodermically has been obstructed. Dr. P. Cesaris now finds that it readily dissolves in a solution of sodium salicylate, and suggests the following effective formula:

Exalgin	1.0 part.
Sodium Salicylate . . .	1.1 "
Distilled Water . . .	10.0 parts.

Ferratin (acid albuminate of iron) is the name given an organic compound of iron which Prof. O. Schmiedeberg of Strasburg, Germany, has separated from the pig's liver. The quantity is too small to be of much service from this source, but Dr. Marfori has succeeded in obtaining it in larger quantities by treating the white of hen's eggs with a solution of tartrates of potassium and iron and caustic soda. It falls down as a reddish-brown precipitate without odour or taste, neutral in reaction and containing between 7 and 8 per cent. of iron. That obtained from the pig only yielded about 6 per cent. Prof. Schmiedeberg recommends it as of service wherever the inorganic iron salts have heretofore been indicated. It is readily assimilated, and is not excreted into the intestines as the inorganic iron salts are. The dose is from 1 to 2 grammes (about 15 to 31 grains) per day.

Dr. Banholzer reports that in anaemia, following acute diseases, and in chlorosis the haemoglobin was quickly increased after its use. The appetite also is improved and a series of comparative trials were made with Blaud's pills, with much better results in the cases where ferratin was used.

Dr. John Harold, L.R.C.P., M.R.C.S., of Charing Cross Hospital, London, England, has made a report on its use in three selected typical cases of very excessive anaemia, and his detailed account is of interest to those who would try it.[1]

Prof. Germain Sée read a note on this agent at the meeting of the Paris Academy of Medicine, on August 21 last, corroborating the testimony of others, and confirming the statement of Professor Schmiedeberg, that it is applicable not only to chlorotic and anaemic patients, but as an alimentary substance in those apparently healthy subjects, who simply need toning up. No deleterious or cumulative effects have been observed.

Formalin—the proprietary name given to a 40 per cent. solution of formaldehyde—continues to be used to some extent, both externally and internally, but chiefly externally. It is the general opinion now that it is superior to corrosive sublimate in germicidal action, and surely far less toxic. It is being used not only as a disinfectant, but as a deodorising agent. Its deodorising effect is immediate in putrifying meat and putrid urine. The peculiar methyl-mercaptan odour of faeces is completely destroyed, and sulphurretted hydrogen is deodorised by chemical reaction with it.

Drs. C. Gegner and G. Hauser have continued their experiments on cultures of various kinds, and are confirmed in their opinion that this agent is a powerful antiseptic.

Two English practitioners, Mr. Chas. Slater, M.R.C.S., and Mr. S. Rideal, D.Sc., both of London, England, have carried on a very complete series of experiments, and find it possesses very decided antiseptic and disinfectant properties. To those interested, their report "On Formaldehyde as an Antiseptic," will be of value.[2]

Formanilid, the analgesic, anaesthetic, antipyretic, antineuralgic, and haemostatic alluded to here last year, has not been followed up as was then hoped for. Gratifying results were reported by several observers at that time which needed confirmation, but possibly other observers are not yet ready to report, for nothing has appeared in print.

Gallanol—the analide of gallic acid, alluded to here last year—continues to find favour with the dermatologists in the treatment of psoriasis and eczema. All the observers appear to acknowledge that although weaker, in other respects it is equal to if not superior to chrysophanic acid. It surely does not stain the linen, can

[1] London Practitioner, vol. liii., p. 87.
[2] London Lancet, vol. i., for 1894, p. 1004.

be applied to the head and face, and does not leave discoloured patches to wear off long after treatment has been suspended.

Gallobromol (Di-bromo gallic acid) has received very little attention in the literature of the year. What has been printed is little else than repetition from journal to journal of the results obtained by Dr. R. Lépine of Lyons, France, and alluded to here last year.

Glycozone has received little attention in the current medical literature during the past year. Undoubtedly it is still used, but few observers apparently have been sufficiently impressed with their results to put them in print.

Guaiacol—the beechwood tar product which should contain a maximum of 90 per cent. of creosote but rarely does—still assumes a most prominent place in the attention of all practitioners, and the literature continues to be very voluminous. Accounts are still conflicting concerning its use in pulmonary tuberculosis, but some remarkably successful results have been obtained from its subcutaneous injection.

Dr. R. Lépine of Lyons, France, and others have met with gratifying results after painting the extremities with from 2 to 10 Cc. (about 32½ to 162 minims).

Professors Linossier and Lannois have recently given the results of their studies on the absorption of this agent by the skin, and its elimination by the kidneys undecomposed—first appearing in about a quarter of an hour. They appear to prove that it actually is absorbed by the skin, for the effects are equal in every way when it is breathed through a tube coming from the supply in an adjoining room. The practical application of this mode of administration is to supplement other modes. The skin, after application, should be covered with oiled silk or rubber to hasten absorption.

Accumulating testimony is becoming stronger in acknowledging guaiacol as a true antipyretic.

Haemogallol and *Haemol*, —the oxidised products of the haemoglobin of the blood—have been practically unheard of during the year except in the literature of the manufacturers. This may be due to the prominence of such close rivals as ferratin, and other like agents.

Ichthyol (ammonium ichthyol-sulphonate) has received much attention during the past year, notwithstanding its disagreeable odour and its disadvantages of soiling the linen. Its antiseptic properties have been frequently extolled. Even in weak solutions,

the cocci of erysipelas are destroyed in a short time. It is strongly recommended as a prophylactic in diphtheria, both internally and as a gargle.

The dermatologists continue to make good use of it. It has been found particularly valuable in acute, chronic, seborrheic, impetiginous, moist, dry, and other forms of eczema, both in adults and children.

Success continues to follow its use in catarrhal conditions of the urethra and bladder, and in simple and gonorrhoeal urethritis.

Dr. Ramon Guitéras of New York city has stated that a 50 per cent. ointment in lanolin has given him by far the best results of any local counter-irritant application in gonorrhoeal rheumatism.

Dr. Malcolm Storer of Boston, Mass., has recently summed up what has appeared on the subject in regard to its use in gynaecology, and his résumé will be found in the *Boston Med. and Surg. Journ.*, Vol. CXXXI, p. 104. His conclusions are as follows :

1. While ichthyol is by no means the gynaecological panacea that some observers have claimed it to be, still it has sufficient approved value to deserve a very high place in our list of remedies.

2. That while its chief action is to relieve pain, it does possess certain resorbent qualities, which in some cases are relatively powerful.

3. That its use is unattended with danger or discomfort.

4. That the use of the pure drug is generally more satisfactory and reliable than that of solutions.

5. That it has not yet been proven that it has any gynaecological value other than as a local application.

Dr. Moritz Cohn, of Hamburg, Germany, believes it to be of great value in the treatment of pulmonary tuberculosis, especially for the poorer classes who cannot avail themselves of the beneficial effects of retiring to high altitudes and sea trips. It is not so costly a treatment as the prolonged use of creosote, and it is better borne than either the latter agent or cod-liver oil. He has obtained gratifying results in over one hundred cases.

Iodoform still holds its own against its substitutes, notwithstanding the disadvantage of odour. Its antiseptic property has been looked into a little more closely during the past year. Prof. L. von Stubenrauch, of Germany, carried on a series of very complete experiments on its effects upon the various tissues, both in man and the lower animals. He was led to this study from its good results in local tuberculous affections. He concludes that it is not an antiseptic, in the strict sense of the word, as is corrosive

sublimate for instance, for it does not destroy bacteria by short contact—it only appears to inhibit their multiplication. It has no specific effect apparently against the tuberculous condition. Its decomposition is seen to occur, not only inside of the body, but outside, and lastly, it acts on the body tissues only after decomposition.

At the sixty-second annual meeting of the British Medical Association at Bristol, England, last summer, Mr. Frederic Eve, F. R. C. S., of London, discussed "Iodoform Treatment in Tuberculous Disease of the Joints in Children," and argued that it is now well established that a 10 per cent. emulsion in glycerin or olive oil is of "value as an adjunct to the usual remedies, or as a prepation for operative measures. Koenig estimates that 30 per cent. of cases are cured by iodoform treatment, and that 50 per cent. may be cured by ordinary physical means." He stated that Dr. Senn was a strong advocate of this treatment, and he quotes him as saying, "that this treatment may prove successful in primary osseous tuberculosis, followed by involvement of the joint, provided the osseous foci are small." Mr. Eve has "seen marked benefit and even cure follow the injection of iodoform into the affected bones themselves in recent tuberculosis of the carpus and in tuberculous dactylitis."

Dr. A. Foxwell, of Birmingham, England, has apparently treated a large number of cases of pulmonary tuberculosis during the past eight years with iodoform, and reports it to be the most satisfactory of all antiseptics. He finds that his advanced cases did as well as the early ones. He usually prescribes six 65 milligramme (1 grain) pills to be taken through each day. He experimented with oil and tonics in conjunction with the iodoform, and then with the oil and tonics alone. His conclusion, after years of trial, was that the iodoform administered alone gave better results than any other single or combined agent, showing on the whole greater improvement in the physical signs than by any other treatment, except that of climate and hygiene. He advises continuation of treatment if necessary for a whole year.

The treatment of goitre by the interstitial injections of iodoform once in vogue had apparently been completely abandoned until recently Dr. K. Garrè of Tübingen, Würtemberg, reported he had been using it for the past three years in treating 140 cases in his surgical wards. His injections consisted of

Iodoform, 1 gramme (about 15 grains)
Olive Oil, 7 " (" 1-4 of an ounce)
Ether, 7 " (" 1-4 " ")

Usually a single injection was all that was required at one time, but occasionally he had used as many as four closely following one another. These were repeated at intervals of either one or two days or a week, as the case called for, and the whole duration of treatment was from three to four weeks. He obtained positive results in 77 out of 87 cases. He claims that this treatment gives best results in goitres showing purely hyperplastic characteristics, but good results are obtained in the colloid and vascular forms as well.

Dr. Carl Beck, of New York city, has obtained good results in the treatment of twelve cases of haemorrhoids by an ethereal solution of iodoform. Those interested in this treatment are recommended to read his report as found in the *New York Medical Journal*, Vol. LX, p. 74.

Iodol (tetra-iodo-pyrrol), alluded to here last year in a more or less promising way, has received no attention in the current medical literature of the year past. This does not necessarily indicate its abandonment, but surely does show that observers, if any, have not obtained results sufficiently gratifying to invite reporting upon in print for the benefit of others.

Izal, the new antiseptic, consisting of an emulsion containing 30 per cent. of a new oil produced by a patent process employed in the manufacture of a special form of coke, and alluded to here last year in a promising way, still receives attention.

A. B. Griffiths, Ph. D., F. R. S., has recently tested its action on the poisonous ptomaines produced in the human system during the course of infectious diseases, in an interesting manner. In his report, made in the London *Chemical News*, Vol. LXVIII, p. 238, he leads up to his actual data as follows: "Until recently the vegetable kingdom was regarded as the only source from which alkaloids could be obtained, but it is now known that bodies which are very similar to the vegetable alkaloids are elaborated in the animal tissues, excretions, secretions, etc., and can be obtained therefrom by suitable methods of extraction. The animal alkaloids, ptomaines, or toxines, are produced during the putrefaction of animal matter, and they are abundantly found in the animal tissues and fluids in pathological states. The urines of persons suffering from scarlet fever, diphtheria, pneumonia, erysipelas, puerperal fever, measles, parotitis, eczema, etc., have all yielded in greater or less quantities alkaloidal substances or ptomaines, which are extremely poisonous in the isolated state. As a rule the ptomaines are the specific products or chemical principles elaborated in the body as the result

of the existence of microbes. At the outset it may be stated that I have extracted and described eleven ptomaines which occur in the urine during certain infectious diseases, and among these ptomaines are those described in this paper. The experiments recorded in this paper were undertaken in order to ascertain the action of izal on the ptomaines which occur in the system during certain infectious diseases. It is essential in the treatment of infectious diseases that not only pathological microbes should be destroyed, but also the poisonous substances, or ptomaines, which they indirectly produce. The izal used in the experiments was diluted with distilled water in definite proportions, and the action of the various aqueous mixtures was tried directly upon the poisonous ptomaines." The data then follow.

Dr. N. A. Blagoveshtchensky, of Moscow, Russia, now reports that he can fully support Drs. E. Klein's and W. B. Clarke's opinions of its antiseptic properties. He destroyed the cholera vibrio, the typhoid and anthrax bacilli and pyogenic microbes in from three to fifteen minutes with an aqueous emulsion of from 2 to 5 per cent. He confirms the previous claim of its non-poisonous character by stating that "even very strong emulsions of the substance are absolutely harmless."

Jambul (jamun), the seeds and bark of the Eugenia jambolana, has received practically no attention whatever in the medical literature of the year. The reports previously made by Drs. Vix and Lawrence in the treatment of diabetis have not been followed up by any others, so that possibly little more may be heard from it.

Kresin, the new antiseptic alluded to here last year as being a simple mixture of 25 per cent. of cresol and 25 per cent. of cresoxyl acetate in water, has not been heard of during the year, so that its life must have been short.

Kristaline, the fancy name given to a solution of pyroxylin (guncotton) in methylic alcohol, is not a new article, but a more efficient product has now been obtained by Mons. E. Thibault of Paris, France, according to the following formula:

Pyroxylin	5 grammes	(about 77 grains)
Pure methylic alcohol . .	20 "	(" 308 ")
Pure amyl acetate . . .	75 "	("2 3-4 ounces)

It is reported as producing a very efficient flexible film, and is practically invisible. A comparison has not yet been reported between this and the officinal flexible collodion, but the volatility

and inflammability of this kristaline are evidently much less, and therefore of decided advantage in these respects.

Lactol (lacto-naphthol) is a new compound prepared in France by Dr. Coez. It is chemically the lactic ether of β–naphtol, and is analogous to benzo-naphtol. It has not yet been used therapeutically except by Dr. Coez himself on himself. He reports having taken one gramme (15.4 grains) for several successive days without untoward effects. He states it splits up into lactic acid and naphtol in the alimentary canal. Its value is yet to be tested.

Lactophenin is a new anodyne and hypnotic combined. It has the same composition as phenacetin, except the acetic acid radicle is replaced by that of lactic acid. It appears in the form of a fine crystalline powder, with a slightly bitter taste, and only sparingly soluble in water (330 parts).

Mr. Landowsky first strongly recommended it—having used it in Dr. Proust's hospital wards in Paris. It was early used to produce antipyrin effects in those patients who could not take the latter. The doses varied from 600 milligrammes to 3 grammes (about 9 1-2 to 46 grains) per day, divided into several doses. Most patients were not disagreeably affected, but a few showed some vertigo and diaphoresis. The smaller doses (600 milligrammes) gave anodyne and the larger ones (1 gramme and upwards) hypnotic effects.

It has lately been administered successfully by Dr. A. Jaquet, of Bâle, Switzerland, in the treatment of some forty cases, including pneumonia, erysipelas, articular rheumatism, influenza, scarlatina, and other affections. Dr. Jaquet places its hypnotic effect somewhere between that of sulphonal and urethane.

Dr. R. von Jaksch, of Prague, Bohemia, has obtained most gratifying results in eighteen cases of typhoid fever. He claims its action in these cases was that of a sedative and not that of an antipyretic, and that there is no other agent now known which acts so powerfully in this disease. He frankly admits that these eighteen cases are not conclusive evidence, but the results were so favourable that he has no hesitation in recommending it most strongly. He cannot admit that all the chances were in his favour in this series of cases, but urges others to use the agent, and surely report their results.

Liquor Sodae Chloratae, U. S. P., is reported by Dr. J. Abbott Cantrell, of Philadelphia, Penn., as being of marked value in cases of ivy poisoning. He obtained very successful results in over one hundred cases, by using the full officinal strength in adult cases; and in children and others with delicate skins, diluting it one half,

effecting permanent results in four or five days, in contrast to the usual two weeks' duration with the now generally recognised remedies.

Loretin is the short name adopted for the very recent substitute for iodoform, discovered by Professor Claus, of Freiburg, Germany, and known chemically as meta-iod-ortho-oxy-chinolin-ana-sulphonic acid. As will be noticed, it is an iodine compound, with characteristics of a phenol and of a chinolin derivative. It appears in the form of very small, fine, bright yellow crystals, almost identical in appearance to iodoform. It has no odour, however, which is its great claim to attention. It is only barely soluble in water or in alcohol. It being an acid, it forms salts, and the calcium salt (red in colour) has been effectively used to impregnate gauze. It has not shown itself as yet to have any toxic properties, but its iodine is very loosely combined, as shown by being very readily set free when brought in contact with any of the ordinary oxidising agents.

In surgical dressings a one to three per cent. solution of the soluble neutral sodium salt is used. This is an orange-red solution. When loretin is used as a dusting powder it is mixed with talc, starch, or calcined magnesia.

It is recommended to be applied in all cases where iodoform would be applicable.

Losophan (tri–iodo–meta–cresol), the new antiseptic of last year, containing about 80 per cent. of iodine, has been unheard of during the past year. Possibly would-be observers are waiting for Dr. Edmund Saalfeld of Berlin, Germany, to complete his experiments and make a further report, as he promised to do a year ago.

Lycetol is a new uric acid solvent known chemically as di–methyl–piperazin tartrate, and described by Dr. Hermann Wittzack of Frankfort-on-the-Main, Germany. It is chiefly recommended for its beneficial action in the treatment of gout. Theoretically considered it has the same solvent action on uric acid as piperazin alone, but being presented in the form of a tartrate, the tartaric acid is claimed to split up into CO_2 which renders the blood alkaline and keeps the uric acid in solution. Diuresis is also produced which hastens the elimination. It has been recommended in 1 to 2 gramme (15.4 to 31 grain) doses per day. After the addition of sugar to a solution of this agent, the taste is that of lemonade, and is thus rendered agreeable for long continued administration. The most reported of it at this time is that it has the power to break up the regular periodical attacks of gout, and that it does not produce any disturbance in the general system.

Lysol—the saponified product of coal-tar, chiefly composed of the cresols—has been more frequently reported on during the past year. It has been found useful both internally and externally in a large number of different affections. Its marked antiseptic property has been of great service in digestive disorders. The dose varies from 50 to 500 milligrammes (about ¾ to 8 grains) given three times a day after each meal—best in conjunction with a little essence of peppermint to disguise the taste.

In sixteen cases of dysentery, 475 Cc. (about 16 f ℥) of a 1 per cent. aqueous solution was injected as an enema three times a day until blood ceased to appear in the evacuations. On the second or third day of this treatment the abdominal pain disappeared and marked general improvement was noticed in all the cases, continuing to a rapid and permanent recovery.

A 2 per cent. lotion in eczema, a 1 per cent. injection in gonorrhoea, a 1 per cent. nasal irrigation in ozaena, and a 1 to 200 solution in peppermint water in acute tonsilitis—all gave very satisfactory results.

In obstetrical practice, a 2 per cent. solution for vaginal injections seems to be the preferable strength, and its further use is strongly urged.

Injections into the bladder even in very weak solutions, are not recommended, as it causes irritation and has been known to produce cystitis.

Although its toxicity is comparatively low, still cases of poisoning continue to be reported, so that caution has to be practised with it as well as with the other coal-tar products.

Dental surgeons now report in its favour in relation to their branch.

Malakin (salicyl–para–phenetidin) is a very recent anti-rheumatic, analgesic, and antipyretic agent, manufactured by the Society of Chemical Industry of Bâle, Switzerland. Chemically it is a combination of phenacetin (para–acet–phenetidin) and salicylic acid (more accurately of salicyl–anhydride). It appears in fine, light yellow, needle-like crystals with only a slight bitter taste, sparingly soluble in cold alcohol but much more readily in hot, and insoluble in water. Acids quickly decompose it into its chief constituents, so that its effect on the system is that of salicylic acid, as might be inferred, but its action is very mild (from which it derives its name μαλακὸς—mild). Two grammes (about 31 grains) of malakin correspond to something over 1 gramme (15.4 grains) of salicylic acid. The salicyl reaction in the urine is obtained in

about twenty minutes after administration. The single dose is 1 gramme (15.4 grains) and is generally repeated about six times in twenty-four hours. It is a remedy which may be given for a prolonged period without disturbing the digestion or other functions of the body materially, and therefore of especial value in habitual headaches—those of chlorosis, for example. In simple headaches it is inferior to antipyrin. Temporary profuse perspiration has been noticed only in a few cases, so that this idiosyncrasy may be considered rather an inconvenience than a contra-indication. It is best given in the solid form—in capsule, wafer, or concealed in some of the small fruits or preserves. Occasionally, eructations of the peculiar salicyl-aldehyde odour have been noticed, but this is not long continued, nor is it very disagreeable.

Dr. A. Jaquet, of Bâle, has apparently been most identified with it, in not only experimenting on the lower animals (rabbits and guinea pigs) but in bringing it before the profession. After establishing its beneficial effects on animals, he proceeded to apply it to man, and he is now able to report on its successful use in 74 cases, including 14 of acute rheumatism, 13 of typhoid fever, 7 of croupous pneumonia, 19 of pulmonary tuberculosis in various stages, 7 of erysipelas, 2 of scarlatina, and 12 of neuralgia and habitual headache.

Dr. F. Merkel, of Munich, Bavaria, reports favourably on its use in 18 cases, including 15 of acute rheumatism, 2 of typhoid fever, and 1 of neuralgic pains accompanying typhlitis. He corroborates the general reports of others as a whole. He finds that whatever antipyretic effect it has is not permanent, but as an anti-rheumatic the improvement in the articular manifestations is very decided. In his 15 cases of acute rheumatism, 9 were favourably affected, in 2 of which other remedies had previously failed. He finally considers this agent of value when others fail, and intimates that further study of its behaviour should be pushed.

Dr. Aurelio Germani confirms the statements of other observers, and reports on his satisfactory results in 8 cases of articular rheumatism. In neuralgic cases, he found those associated with anaemia the most benefited, but it was inferior to antipyrin and phenacetin. In two cases of pneumonia, with elevated temperature, its antipyretical effect was marked.

Dr. O. von Bauer, of Vienna, Austria, reports on his hospital cases, and summarises his conclusions, which may be taken as very fair and conservative observations: 1. It has anti-rheumatic action, but somewhat less sure than salicylic acid, although tinnitus rarely

occurs; 2. It reduces the subjective symptoms of fever, and also the temperature somewhat, but its antipyretic action is less than either antipyrin or phenacetin; 3. It should only be employed as an antipyretic, when for some good reason the last two effective agents are contra-indicated; 4. He finally advises giving it in 500 milligramme (about 8 grain) doses, repeated at intervals varying with the effects to be produced and the result looked for.

Nothing has been reported from this country as yet.

Menthol is now in a position to take a legitimate place among those remedies which have gone through the stage of extravagant claims and fashionable crazes, and have settled down in the sphere in which the conservative observer works.

Dr. James McNaught's favourable observations alluded to here last year have been followed in the same line by Dr. Frederick C. Coley of Newcastle-upon-Tyne, England, in that he reports in an article on "The Drug Treatment of Phthisis," the use of a solution of 20 per cent. of menthol and 3 per cent. of guaiacol in olive oil, as an intra-laryngeal injection. He admits he was somewhat skeptical when he read of its successful use by others, but since using it himself he has entirely reversed his opinion, for his results were beyond his expectations. Injections repeated every two or three minutes of 1.2 to 1.8 Cc. (twenty to thirty minims) of the above solution often relieved the dyspnoea of phthisis in a very striking manner, "and the relief from cough often lasts for two or three days. The rest and sleep which are thus secured (without the drawbacks which attend the administration of sedative cough mixtures) are a material help to the patient in the struggle against the disease; and in some cases there appears to be a direct effect upon the local morbid processes. Any patient who is able to tolerate an ordinary laryngoscopic examination can bear these injections, provided they are administered with a reasonable degree of expertness." He gives what he considers important details as to the mode of handling the syringe which it would be advisable for those to follow who may desire to repeat his good results.[1]

An additional formula to those mentioned here last year to be employed in cases of the vomiting pregnancy, is now offered:

Menthol	2.6 grammes	(40 grains)
Oil of bitter almond . . .	11.7 "	(180 ")

Six to ten drops are given on a lump of sugar.

Methyl Acetate. Experiments are now in progress for the

[1] London Practitioner, vol. liii, p. 276.

manufacture of this product in large quantities and at a proportionally small cost, inasmuch as this acetate is a solvent of remarkable powers, and in many cases could be used as a substitute for ether. The starting point is of course crude wood spirit, of which all the various by-products would be put to good use.

Methylene Blue (tetra-methyl-thionine chloride)—the analin derivative—continues to be used, but with more or less conflicting results.

Dr. Rosin, in Germany, and Mr. Bertram Hunt, M.R.C.S., of England have carried on a series of experiments in relation to its action on bacilli. Dr. Rosin concludes that this agent, when used against the bacilli of malaria, seemed to act as a germicide, and not chemically as some have claimed. Mr. Hunt's series is very elaborate, and he appears to have taken great pains and manifested a degree of thoroughness not before shown. Those who are interested in such work are recommended to read his report in the London *Lancet*, Vol. II, for 1894, page 733.

From Germany, Dr. Ernst Fratnich reports three out of four cases successful when using this agent in malaria.

From Mexico, Dr. A. Matienzo gives a favourable report of its use in nine cases of intermittent fever. It does not supersede quinine, however, in serious cases.

Prof. Thur reports excellent results in eleven cases of Beri Beri.

From France, Mons. G. Richard d'Aulnay reports having made good use of it as a bactericide in nine cases of purulent vaginitis, by simple application. Infectious lesions of the mouth, fistulous tracts, and female urethra have been treated with excellent results.

Dr. Szczesny Bronowski, of Warsaw, Russia, has lately followed Dr. Althen, of Weisbaden, Germany (who earlier called attention to its marked beneficial effects in pulmonary tuberculosis), and made good use of it in eight consecutive cases. The results varied some, but taken as a whole, were sufficiently satisfactory to warrant further trials.

Prof. A. d'Ambrosio's use of this agent (alluded to here last year) in a case of cancer of the breast, with others, led Dr. Charles E. Jennings, M.S., F.R.C.S., of England, to make further trials in this line. He sums up his conclusions as to its value in cancer as follows: "(1). If injected locally into the growth, it will cause resolution of those portions with which it has been brought in contact; but other portions of the growth will progress uninterruptedly. Therefore, methylene blue can only be considered curative for small growths, if administered by interstitial injection.

"(2). If administered internally, the drug will, by means of the circulation, be brought into contact with each individual cancer-cell, and if without danger to life, a sufficient quantity of the medicament could be exhibited, extending over a sufficiently lengthy period, the vitality of the cancer-cells, or the microbes causing them (if such exist), would probably be destroyed.

"(3). In cases where dissemination of the neoplasm through the vascular system is occurring, any cells passing through the circulation will be brought in contact with the methylene blue."[1]

At the meeting of the Paris Academy of Medicine, on May 22 last, Dr. A. Darier reported having rapidly cured (?) a number of cases of cancerous tumors of the face by daily applications of a 5 per cent. solution. He advises cauterising with the galvano-cautery or chromic acid first to obtain more satisfactory and quicker results. Injections are recommended as the best means of reaching inaccessible tumors.

Migranin is a new substance supposed to be a double citrate of antipyrin and caffein, and reported efficient in sick headache and neuralgia.

Dr. Martin Overlach, of Germany, describes it in a report he makes, after having used it for five years. As its name suggests it is to be used in cases of migraine and other forms of headache. He claims it to be an "almost infallible cure," even in the most obstinate cases, and is equally efficient either in the premonitory stage or after the headache has developed, for he reports "no failures." The single dose is 1.1 gramme (seventeen grains) given in a little water, and rarely more than one dose is required, but if more is called for the interval should be two hours. The above single dose contains about one sixth of the usual maximum dose of caffein. Dr. Overlach advises the patient to remain quiet after administration, especially in severe cases.

No one else has reported on this agent as yet.

Napthol—β-napthol—(officinal)—is still proving itself to be the powerful antiseptic Bouchard claimed it to be, and as the present U. S. Pharmacopoeia recognises it, there is little doubt but that it has come to stay, and a broader field of usefulness awaits it.

At a meeting of the Paris Medical Society of the Hospitals on October 27, 1893, Dr. Rendu presented a woman cured of tubercular peritonitis by the intra-peritonaeal injections of napthol-camphour (camphourated napthol). His conclusions were that anti-

[1] Medical Week, vol. 2, p. 205.

septic injections should be tried in all cases as a matter of routine before resorting to laparotomy.

At a meeting of the same society on February 23 last he reported another case of abdominal injection of the same agent for tubercular peritonitis in a girl of sixteen years of age, presenting extensive ascites. The tubercular character of the case was substantiated by injecting the ascitic fluid drawn off, into guinea pigs.

As a prophylactic irrigating fluid in cases of measles, Dr. Siredey uses in the wards of the Paris hospitals a mixture of 200 milligrammes (about 3 grains) of β-naphtol to one litre (about 33 f℥) of water.

As an ointment in the treatment of favus, Dr. Schwimmer uses:

β-Naphtol	6 grammes	(about 93 grains)
Peruvian balsam . .	5 Cc.	(" 81 minims)
Vaseline	60 grammes	(" 2 ounces)

Dr. Petresco, of France, strongly recommends β-naphtol in the treatment of typhoid fever, and reports six hundred and forty-seven cases treated by this agent, alone or in conjunction with quinine sulphate. He claims that if thus treated in the beginning the attack can be mitigated and even arrested. The administration must be repeated every day until recovery is established, and finally that this treatment is incompatible with that of alcoholics, since alcohol is a solvent for this agent.

Dr. S. Solis-Cohen, of Philadelphia, Penn., has made good use of benzonaphtol and bismuth salicylate in summer diarrhoea.[1] He uses the following combination in capsule, cachet, or powder—for adults:

Benzonaphtol,
Bismuth salicylate,
Powder of ipecac and opium, of each 324 milligrammes (5 grains).

For a child 2 years old:

Benzonaphtol	130 milligrammes	(2 grains)
Bismuth salicylate . . .	130 "	(2 grains)
Powder of ipecac and opium,	32 "	(½ grain)

Neurodin (acetyl-para-oxy-phenyl-urethane) is a new anti-neuralgic and analgesic, occurring in colourless and odourless crystals, only very slightly soluble in water, and recommended by Dr. J. von Mering, of Halle, in Saxony, Prussia, after a series of experiments

[1] Phil. Med. News, vol. lxv, p. 97.

on dogs and rabbits. It possesses antipyretic properties, but it is too sudden in its action to be used as a general antipyretic, and minimum doses of 0.5 gramme (about 8 grains) only are prescribed when thus used. In 1 gramme (15.4 grain) doses given in wafers, it is an effective analgesic in neuralgia, migraine, headache, rheumatism, sciatica, tabes dorsalis, and many other affections where pain is prominent, responding in about half an hour after administration, but it may be necessary to increase to 1.5 grammes (about 24 grains). Dr. von Mering has used it now for two years, treating some 24 cases of febrile and 30 of neuralgic affections, and finds no disadvantages—comparing favourably with other remedies used for the same affection. He has even given as much as 6 grammes (about 93 grains) in 24 hours without ill effects.

Odontodol is the fancy name given by some Frenchman to a mixture rcommended for dentists' use as an anodyne. It consists of

Cocaine hydrochlorate	1 part.
Oil of cherry-laurel	1 "
Tincture of arnica	10 parts.
Solution of ammonium acetate	20 "

It appears to be efficacious, but care must be exercised in its use, that none be swallowed.

Orexin (phenyl-dihydro-quin-azoline)—the appetite promoter—has been practically unheard of during the past year. It was hard to realise that much could come of this agent when last alluded to, and possibly even now it is retiring for good.

Paraform is the short name proposed by Dr. Aronsohn, of Berlin, Germany, for the polymeric form of formic aldehyde. Formic acid, found in ants and other of the lower animals, as well as plants, is also obtained chemically by decomposition of several known products after proper treatment, but is obtained chiefly by the oxidation of methylic alcohol. Formic aldehyde then is the oxidation product just preceding the formation of formic acid.

Professor Berloiz, of Grenoble, France, rather objects to adopting this name, as being inappropriate, and suggests the name of triformol, for the reason that, graphically, this product appears to consist of one molecule of formol condensed three times. It is described as occurring in colourless crystals insoluble in water.

At a meeting of the Society of Physicians, in Berlin on March 12 last, Dr. Aronsohn called attention to it as being of value as an intestinal antiseptic, and recommended it also in the treatment of pulmonary tuberculosis.

One of the great advantages claimed for it is its activity even while in a state of vapour. Its physiological effects are similar to those of calomel. Small doses appear to produce a constipating effect, but doses over 4 grammes (about 62 grains) produce free evacuations. Given in pill form, it apparently is badly borne, and enemata with oil are painful; but successful results have been obtained in the treatment of pulmonary tuberculosis from inhalations of the air which has passed through a solution of this agent. In acute coryza and tracheo-bronchitis, it was of especial benefit, relieving the hoarseness promptly, diminishing the nasal secretion, and stopping the cough and expectorations very shortly.

Nothing has been reported beside the above.

Paraldehyde (officinal) is now probably too well recognised by all practitioners to call for the publication of well known results through the medical journals; and, therefore, this may be the reason for seeing so little mention of it during the past year. It is used very largely and, it is to be hoped, not indiscriminately, the better it is becoming known, although the establishment of *a habit* is still reported. Fortunately the habit is easily broken up, and no bad results, as a rule, follow even its abuse, although prostration and nervous disorders are on record.

Dr. Gilbert Van Vranken, of San Diego, Cal., reported to his county medical society a carefully prepared account of his observations on its use in conjunction with strychnine in alcoholism. He reports on 30 cases, and gives an interesting tabular view of 26 of them. He concludes his remarks with the following moderate statement: "Most of these patients on entering the hospital were tormented by the thirst for alcohol, but many on leaving said they had no desire for it, and we know did not go back to their old habits at once. A few of those that could be followed we know abstained for some months, but at this date it is impossible to say if any experienced what is called 'a cure.'" Those interested in this class of cases are advised to read his report in the New York *Medical Record*, Vol. XLIV, page 711.

Pental (tri-methyl-ethylene), formerly known under the name of amylene, has continued to find some favour as an anaesthetic in minor operations; but it cannot be said to be professionally popular as yet.

Professor Phillip, of Berlin, Germany, has made a report on its use in the Kaiser Friedrich Children's Hospital of his city, where it had been used constantly for one year. He sums up its principal advantages as being remarkably rapid in accomplishing complete

narcosis, rarely producing excitement, but when occasionally present, disappearing after the narcosis had become complete; prompt recovery after administration was suspended; total absence of the after effects of chloroform; and finally, after 1,000 successful administrations, with a few exceptions, showing itself superior to chloroform in all respects.

Mr. T. E. Constant recently read a paper before the British Odontological Society on the "Production of General Anaesthesia by this Agent in Dental Operations." Early in his investigations he attempted to produce anaesthesia by simply pouring the liquid upon lint within the usual towel cone, but he soon found that much time and liquid were wasted, for it is very volatile, besides being extremely inflammable. Finally, he used a device of his own, based on the principle of the Ormesby inhaler. His conclusions were that, although it might be considered safer than chloroform, it was more dangerous than nitrous oxide gas, and that he would strongly advise the latter for all short operations. It certainly did show, however, the following prominent advantages: marked facility of administration; certainty of action; rapidity of recovery; and the total absence of disagreeable after-effects.

Pharmacopoeia of Switzerland.—The new Pharmacopoeia for Switzerland was declared in force on July 1, last,—six months after the new revision of the U. S. Pharmacopoeia took effect—and is mentioned here simply to call attention to the great advance made. Previous editions had always been printed in Latin, but this one only retains the Latin denominations of drugs and preparations, while the text is printed in French, German, and Italian—three separate editions. The index is in Latin, French, German, and Italian, thus those practitioners living in the border countries will be greatly benefited. These provisions make the whole more like an international Pharmacopoeia than anything yet attempted. Those who have been warm advocates of a universal Pharmacopoeia will readily appreciate this step in advance.

Great Britain is now agitating the subject of a new revision of her book, which her colonies are looking to for recognition. It is to be hoped that this may be another step forward in the advance already accomplished in the various national standards.

Phenacetin (para-acet-phenetidin) has still a very large and successful use, but some conflicting results may be due to its very evident adulteration at times. Acetanilid is largely used for this purpose, and of course vitiates therapeutic results. This adulteration may be due either to intentional introduction, or to possibly

carelessness in the manufacture. Another element in its poor results may be found in the presence of unconverted phenetidin.

In addition to its more or less general routine use internally in influenza, and as an analgesic in all forms of pain, the French are applying it externally in cases of acute rheumatism, according to the following formula:

Phenacetin	4.5 grammes (about 75 grains)
Lanolin	23.0 " (" 360 ")
Olive oil	a sufficient quantity.

Phenatol is another new compound reported by Dr. Adolph Welter to be a mixture of acetanilid, sodium bicarbonate, sodium carbonate, sodium sulphate, sodium chloride, and caffein.

Phenocoll (amido-para-acet-phenetidin), particularly the hydrochlorate, still holds its own as an antipyretic, even being considered by some as the ideal antipyretic. In a certain class of cases it still is considered an effective substitute for quinine. It appears to be valuable in acute, but not in chronic, rheumatism. It is claimed to be specially suitable to administer to children. It is recognised by some as an excellent intestinal antiseptic. Still conflicting statements continue to be made which invite skepticism.

Picrol (di-iodo-resorcin-mono-sulphonic acid), the new antiseptic of last year containing 52 per cent. of iodine, has not been reported on during the year, and it would therefore seem that its promoters, alluded to here last year, have failed in attracting attention to it.

Piperazin (di-ethylene-di-amine) continues to receive marked attention.

Drs. Joseph Gruber and H. Hildebrandt, of Elberfeld, Germany, have lately made good use of it in the treatment of diabetes mellitus. The daily doses varied from about 1 to 2 grammes (15.4 to 31 grains) given three times a day about an hour before each meal. The treatment was continued about five weeks. Its action is explained as inhibitory to the transformation of glycogen into sugar.

Dr. John R. Hamilton, of Hawick, N. B., reports having used it with complete success for eighteen successive months in the internal treatment of renal colic. The diet, of course, was strictly regulated.

Dr. John McKinlock, of Chicago, Ill., reports on the very satisfactory treatment of four cases of nephritic colic, in which he is so well pleased with this agent that he intends to push the subject further.[1]

[1] N. Y. Med. Jour., vol. lx, p. 207.

Dr. E. D. Mapother, F.R.C.S.I., of London, England, makes a report on the use of this agent together with other eliminants in the treatment and prevention of gout.[1]

Dr. D. D. Stewart of Philadelphia, Penn. makes a very interesting and elaborate report on "The Influence of Piperazine on the Urine, and especially on Uric Acid and Urea Excretion." He presents carefully prepared tables of his results, and calls attention to the "Untoward Effect of Large Doses of the Drug."

Dr. John Gordon of Aberdeen, Scotland, has recently presented to the profession "A Contribution to the Study of Piperazine." His tracings and tables are very interesting and instructive. His "Summary of Results" may be considered as bringing the subject, viewed physiologically, well up to date. They are as follows:

"1. Piperazine is not wholly oxidised in the body, and may be detected in the urine of those to whom it is exhibited.

"2. Piperazine in solutions of 1 per cent. in normal urine, when kept in contact at a temperature of 39° C. (body temperature) for a given time, has the property of dissolving to a great extent a fragment of a uric acid calculus.

"3. That the stronger the solution of piperazine in urine (up to 7.5 per cent.) the earlier did the solvent action begin and the more rapid was the completion.

"4. That, notwithstanding this, with the stronger solutions of piperazine in urine, the rate of solubility was not so markedly rapid over the weaker solutions as might be expected.

"5. That the solvent action of piperazine in similar circumstances was greater than any other of the substances that were employed, namely, borax, lithium citrate, sodium carbonate, and potassium citrate.

"6. That piperazine, in weak and strong solutions in urine, converted the undissolved portion of the calculus into a soft granular or pulpy condition.

"7. That neither borax, lithium citrate, sodium carbonate, nor potassium citrate in similar circumstances rendered the fragment of calculus soft or pulpy."[2]

Pixol is the name given by Dr. Raptchevski to a "cheap disinfectant" prepared by dissolving 1 part of green soap (soft soap) in 3 parts of tar, and adding slowly a solution of caustic alkali of definite strength. This gives a syrupy liquid which is diluted down to 1 to 19, thus furnishing a 5 per cent. solution.

[1] London Practitioner, vol. liii, p. 265.
[2] British Med. Journ., vol. i, for 1894, p. 1291.

It is recommended for the general disinfection of linen and the hands. Double this strength is called for when disinfecting dejecta.

It has apparently been used successfully in certain cutaneous and venereal affections by Dr. Doukalsky in his military service—as acute dermatitis, psoriasis, simple chancre, and the like.

On the other hand, in the cholera wards of a St. Petersburg hospital it has not proved at all satisfactory.

Pyoktanin (methyl-violet)—the anilin dye "pus destroyer"—is still being tossed about unceremoniously by the conflicting testimony of those who are seeking the ideal claimed by a few observers.

Dr. C. Hörning has followed up his 27 cases of the treatment of diphtheria by this agent reported last year, by continuing to use it with success in 110 additional cases, including many serious ones which had been despaired of—all cured. He goes so far as to claim that it is a specific in diphtheria.

M. Gottlieb cannot verify the results of others in its use in diphtheria, but does claim brilliant results with kerosene (petroleum) after having failed with pyoktanin. He even found the latter to aggravate the local lesions.

Dr. Hilbert reports a case of diphtheritic conjunctivitis in which he met with success in the use of a 3 per cent. solution together with warm fomentations three times a day.

Dr. Flavel B. Tiffany of Kansas City, Mo., read a paper before the 44th annual meeting of the American Medical Association on the place of this agent in the affections of the eye. His views were not generally received with favour as being satisfactory testimony of its efficiency in that class of cases. Drs. J. H. Thompson and Hotz rather refuted his testimony.[1]

Dr. Klevtzoff reports successful results with a 1 to 500 aqueous lotion of this agent after trying many others, including tuberculin in the treatment of a case of multiple tuberculous ulcers.

Dr. Mosetig-Moorhof of Vienna, Austria, reports a case of a woman with a carcinomatous tumor as large as a fist, located below the right costal arch and diagnosed as a tumor of the gall-bladder. The bladder was opened and discharged. Every few days a small quantity of pyoktanin was introduced, and a dose of 575 milligrammes (about 9 grains) was given by the mouth every day. Under this treatment the patient made marked improvement;

[1] Journ. Amer. Med. Assoc., vol. xxi p. 565.

gained in weight and strength, slept better, had a better appetite, and expressed herself free from pain.

Dr. Darier reported at a meeting of the Paris Academy of Medicine in May last, quite a series of cases of cancerous growths of the face rapidly responding to a 5 per cent. aqueous solution. He appears to regard it as a specific in this class of cases.

Dr. Maibaum of Dorpat, Russia, reports on three cases of advanced carcinoma of the stomach, in which rapid arrest of distressing symptoms was very marked after the use of this agent, and concludes that it decidedly arrests disintegration, improves the digestion, and increases the general strength of the patient.

Dr. Vassiliew, from the same section of country, has met with such gratifying success in the same line of cases that he strongly urges others to experiment with it. He has seen beneficial results follow when treating other viscera beside the stomach. The dose is 60 milligrammes (about 1 grain) in pill form three times a day, or in a suppository according to the following formula:

Pyoktanin	0.06 gramme	(about 1 grain)
Extract of belladonna . .	0.02 "	(" $\frac{5}{16}$ ")
Cocoa butter	2.00 "	(" 31 ")

Dr. V. Schultz agrees with Dr. Vassiliew in urging this agent in the treatment of visceral cancer. For cancer of the rectum he recommends the following slightly different suppository:

Pyoktanin	0.060 gramme (about 1 grain)
Powdered opium	0.005 " (" $\frac{1}{16}$ ")
Cocoa butter	sufficient to make up.

Pyretine is a new antipyretic and analgesic, introduced and largely advertised by an enterprising American firm. It is presented in the form of powders and tablets, samples of which have been freely distributed to the profession of this section of the country, if to no other.

Dr. Adolph Welter reports that, although it is claimed to be a "definite chemical substance from the benzine or aromatic series of hydrocarbons," he finds it to be a mixture of acetanilid, caffein, calcium carbonate (common chalk), and sodium bicarbonate—58 per cent. of the mixture being acetanilid and 7 per cent. caffein.

Little else has been heard of it as yet.

Quinine Chlorhydro-Sulphate, the new salt claiming, last year, great therapeutic advantages over the simple sulphate, has been

unheard of since then. Its promoters were Frenchmen, but sufficient prominence has not been given it, even in France, to encourage any one to put anything into print.

Resol is the name given to a new proprietary disinfectant emanating from that great source of like articles, Germany. It is very similar to creolin, being a mixture of wood-tar saponified with caustic potash and wood spirit. A 3 per cent. solution is claimed to be destructive to the bacilli of typhoid fever, anthrax, and similar affections in about ten minutes. Little is known of it generally as yet.

Resorbin is a new excipient introduced by Dr. Ledermann, and prepared by a patented process of emulsifying pure almond oil with distilled water in a special apparatus—finally adding yellow wax, gelatine, soap, and a little lanolin.

It is claimed that it is absorbed by the skin with the aid of only slight friction or pressure, and no hard rubbing. It is intended to appeal, of course, to the dermatologists particularly, but it is not yet apparent what are its marked advantages over the officinal oleic acid. It is stated to be free from unpleasant odour, which may be one advantage over the latter, but few patients are offended at the slight oleaginous odour of oleic acid.

Its extreme rapidity of absorption seems to call for caution, and might be considered by some as rather a disadvantage than otherwise.

It has not been obtained in this country as yet.

Resorcin (officinal) continues to be largely used, particularly by the dermatologists and laryngologists, and little new concerning it has been reported.

Retinol (resinol) has not been heard of during the past year. It may still be in use, but nothing new has appeared in print.

Salacetol (salicyl-acetol) has been practically unheard of during the past year, except through the manufacturers and their agents.

Salipyrin (antipyrin salicylate) has apparently been used more largely during the past year, and is especially recommended in the treatment of uterine haemorrhages, amenorrhea, influenza, certain forms of rheumatism and neuralgia, and yet the conclusion drawn here last year is still applicable, that nothing has been reported to show that far better results cannot be obtained from the administration of the two component ingredients in proportions varying with the circumstances of each case, rather than being compelled to give the proportions offered in the compound.

Salocoll (phenocoll salicylate) has been practically unheard of

during the past year, except from the manufacturers. It is very probable that its claimed advantages over phenocoll or phenocoll hydrochlorate have not been recognised in general practice.

Salol—phenyl salicylate—(officinal) continues to meet with favour, and much has been reported upon it during the past year. Some practitioners even go so far as to state that it has supplanted the other salicylates in their practice.

Although the testimony is still conflicting as to its usefulness in cholera, still it has its warm advocates in that application, but they insist that it must be given early. At the very first appearance of diarrhoea, give it as a matter of routine. It has been of service in all forms of diarrhoea, so it appears to be wise, they claim, to give it on general principles.

In typhoid fever it has given good results.

It has been largely used as a coating for pills, but it must be remembered, in this connection, that experiments show that it is not dissolved in the stomach by the secretions there, but must reach the duodenum before it disintegrates and splits up into its two component parts. Again caution must be exercised as to overdosing, or too long continuation of its administration, for toxic effects are still being reported, with all the symptoms of carbolic acid poisoning.

In pulmonary tuberculosis it still is apparently of marked benefit, even in some severe cases.

Finally in angina pectoris, it continues to keep up its well known reputation.

Salophen (acetyl-para-amido salol) has not been written upon nearly as much as last year, although it is still in constant use, and with much benefit. It must not be considered a powerful antipyretic, but rather as doing its best in such affections as have neuralgic tendencies.

It continues to be of much service in acute rheumatism, by apparently rapidly removing all pain and exudation in the joints. The digestion does not appear to be affected as a rule.

Dr. Richard Drews, of Hamburg, Germany, has recently extended its use from adults to children, in affections having a rheumatic or neuralgic tendency. He finds also that it is of great value in children in cases of scarlatina, typhoid fever, pneumonia, tuberculosis, and in the restlessness and headache accompanying the beginning of some cases of sore throat. He treated some fifteen cases of acute rheumatism in children varying from seven to fourteen years of age, giving from 325 to 500 milligrammes (about five to eight

grains) every two hours. In five cases of muscular rheumatism of the neck, he was also successful. Good results were obtained in a case of purpura rheumatica in a fourteen-year old girl. After she had become wet through, the girl sat in this condition throughout her school hours. The next day her limbs were wrapped in cotton, and 500 milligrammes (about eight grains) of this agent was administered internally every two hours. In twelve days she was up and about, and well on to recovery. Similar treatment succeeded in a thirteen-year old girl suffering from rheumatic chorea. Migraine in five children was dissipated after two or three doses. Toothache, of rheumatic origin, was completely relieved by a 500 milligramme (about eight grains)dose.

This agent is not a disagreeable one to children, and may be given in the powder form directly, and washed down with a little water.

Saprol—the so-called "disinfection oil"—has received very scant attention during the past year, but possibly so for the reason that its marked advantages have not been made sufficiently prominent. Prof. Scheurlen, therefore, takes pains to point out its comparative merits. He states that it far outranks all other disinfectants in rendering infected stools and cesspools innocuous. It possesses the property of throughly mixing by diffusion with the matter to which it is added, and does not either settle down to the bottom or float on top as some of the other agents are prone to do. The objection that it is inflammable, brought out by its opponents, is refuted by Prof. Scheurlen.

Salumine is a new astringent recommended by Dr. P. Heymann, of Berlin, Germany. It appears in two forms ; a simple aluminium salicylate, insoluble in water, and a soluble double salt, ammonium and aluminium salicylate. It has been used with effect by Dr. Heymann in the form of insufflations and douches in the treatment of ozaena.

Little is yet known of it except the above.

Somnal—the liquid hypnotic compound made by the union of chloral, alcohol, and urethane—has rather subsided during the past year.

Dr. Giovanni Memone, however, reports good results in some forms of insanity. He regards it as superior to either chloral, sulphonal, or trional in many cases. In the insomnia of hysteria of pulmonary tuberculosis he finds it of great benefit.

On the other hand, Dr. Hans Evensen regards it as very uncertain. It may be employed in cases of chronic mania, and in quiet

melancholics, but he finds it of little use in acute mania. He would regard this agent as superfluous.

Sozo-Iodol (di-iodo-para-phenyl-sulphonic acid)—the antiseptic substitute for iodoform—is apparently rather on the wane. It has now few enthusiastic adherents.

Dr. Max Teichmann, of Berlin, Germany, reports gratifying results with the potassium, sodium, zinc, and mercury salts of this acid. He has made good use of the potassium sozo-iodolate in affections of the external ear in which there was a copious discharge, by dusting the powder on. The discharge was dried up rapidly, and especially in chronic cases, but if caries be present it apparently acted no better than other known agents. The milder sodium salt was preferable in very sensitive patients. The zinc salt in the form of a lanolin ointment, was of service in aggravated cases of eczema of the nares, and although in some instances it at first produced irritation, it was astonishingly rapid in its action. The mercury salt was used in the same form and in the same class of cases as the zinc salt, and found to be less irritating, but it is not so rapid in action.

In atrophic rhinitis all these salts were found to be too irritating.

In the after treatment of operations on the nose, Dr. Teichmann has now discarded iodoform completely, and prefers the potassium sozo-iodolate. He considers that its employment in many other conditions may also prove of great benefit.

Spermin (testicle juice) has, unfortunately for itself, lost its originator and greatest champion by death during the past year, and may now gradually retire into at least a minor position, if not permanently. Conflicting results continue to be reported, and even stronger statements of absolute uselessness are used. Conservative observers are naturally skeptical of the claimed benefits. Cases continue to be reported where apparent success has followed its use, but the observer is candid enough to recognise that spontaneous amelioration is often noticed in his cases.

It is interesting, however, to read the observations of Dr. Alexander W. Poehl, of St. Petersburg, Russia. He has found this principle in the form of a phosphate in the thyroid gland, thymus gland, spleen, ovaries, and the blood, as well as in the testes, and believes it to be the product of the retrogressive metamorphosis of albumens (a leucomaine). He looks upon it physiologically as a most powerful intraorganic restorative of the oxidising properties of the blood.

He concludes that it should not be regarded as a specific for any

particular form of malady, but as a means of promotion of the oxidations in the body.

Its greatest fitness appears to be in cases of mental diseases of two classes: ataxy and delirious epilepsy.

Stercsol—the antiseptic varnish—has been unheard of during the past year. Possibly Professor Berlioz, of Grenoble, France, who introduced it, may still make use of it, but no one has thought enough of it to report any results.

St. Jacob's Oil at one time was very extensively advertised, and therefore quite naturally largely used. Whether the great benefits claimed to be derived from its use were ever fully realised or not is a question, but latterly it has somewhat subsided, although still quite generally seen. However, it is interesting at this time to note its analysis as presented to the editor of the *British Medical Association Journal*, by Mr. William Murrell of Cavendish Square, London W., England. He gives the parts in percentages as follows:

Turpentine, with traces of camphor	82.407
Ether	10.000
Alcohol	5.000
Carbolic acid	2.018
Capsicum	0.400
Aconite	0.013
	99.838

As to prices and evident profits, it has been calculated that for a bottle which is charged at about 62 cents, the cost of the materials amounts to somewhat under six cents—something over 900 per cent. profit.

Sulphonal (di-ethyl-sulphon-di-methyl-methane) is still in constant and large use, but there are so many other safer hypnotics at the present time that many practitioners are gradually dropping its use. It is now well recognised that its prolonged use is generally attended with danger, and yet again what appear to be heroic doses have been taken either intentionally or accidentally, and no fatal issue ensues. By far the largest and most successful users are the insane asylums. There its action can be studied best, and with them apparently its general or prolonged use is not practised. When given even in either acute, recurrent, or chronic mania, or in melancholia, it is rarely continued longer than a dose or two, but only administered in the stages of extreme excitement or restlessness. Where the administration is called for over a more or

less protracted period, their policy is to alternate with some other hypnotic as chloralamid.

Symphorol is a new synthetic compound prepared for its special diuretic effect. Chemically it is sodium-caffein-sulphonate, and it occurs in fine colourless crystals, with a bitter taste like quinine, without odour, and soluble in water. It was prepared specially to counteract the irritant effects of the caffein by introducing a sulphon radicle into its composition, according to observations made by Drs. R. Heinz and A. Liebrecht. Its diuretic action is claimed to be very decided, and it produces no disagreeable secondary symptoms.

It is much too new an agent to have been reported upon very generally, and only one observer has given his results, which are negative. Mr. Ernest E. Waters. M. D., of Sheffield, England, tried it for five weeks, and gives a clinical report of the negative results of his four cases. "In no case could any appreciable benefit be ascribed to the symphorol."[1]

Tannal is the short name given to the chemical salt, aluminium tannate. This salt is insoluble, but a double salt is formed with tartaric acid which is readily soluble, and is claimed to be a very effective, non-irritating astringent by Dr. P. Heymann, of Berlin, Germany, who has employed it in his laryngological and rhinological practice. The single salt has been successfully used by insufflation.

Tannigen (acetyl tannin) is the name given by Dr. H. Meyer, of Marburg, Prussia, to a new chemical combination obtained by treating (with heat) a solution of tannin with a mixture of glacial acetic acid and acetic anhydride, and finally (after cooling) neutralising with a weak soda solution. It appears as a greyish-yellow, odourless, and tasteless powder, insoluble in water and acids, but readily soluble in alkaline solutions. To obtain a modification of tannic acid with the above properties was the aim of Dr. Meyer, whereby it might pass through the gastric digestion unacted upon and there meet the alkaline intestinal fluids where it would be split up and exercise its astringent properties. His experiments on rabbits were so satisfactory that he immediately applied it to the human subject. He found it of marked benefit in chronic diarrhoea.

Dr. F. Müller, also of Marburg, confirms Dr. Meyer's results as to its usefulness in chronic diarrhoea, but says it is especially efficient in tuberculous patients. He has also tried it in other affec-

[1] British Med. Jour., vol. i, for 1894, p. 1241.

tions of the digestive organs. The average dose is from 200 to 500 milligrammes (about 3 to 8 grains), but as large doses as 4 grammes (about 62 grains) have been given for a prolonged period without inconvenience.

In acute diarrhoea of adults, and in cases of infants, its action is practically negative.

It is apparently effective in chronic pharyngitis when painted on in the form of a 5 per cent. solution of sodium phosphate with 3 per cent. of tannigen in it.

Teucrin—the name given to the extract of the European perennial plant, Teucrium scordium (water germander or woodsage) alluded to here last year—has been practically unheard of during the past year except through the manufacturers' publications.

Thermodin is the short name given a new patented antipyretic of the milder type, chemically known as acetyl-para-eth-oxy-phenyl-urethane. It is closely allied to neurodin. It is presented in colourless, needle-like crystals, practically without odour or taste, and very sparingly soluble in water.

Prof. J. von Mering, of Halle, Prussian Saxony, has successfully used it in about 50 cases of febrile affections including typhoid fever, pneumonia, influenza, pleurisy, tuberculosis, erysipelas, and diphtheria. Nothing like nausea, collapse, or cyanosis occurred after its administration in doses of 500 milligrammes (about 8 grains). As high as 650 milligrammes (about 10 grains) have been given with good results, but it has been found expedient to begin with say 350 milligrammes (about 5 1-2 grains) in cases of pulmonary tuberculosis, when the above maximum need not be reached before good results are obtained.

The experimental and clinical experience of Dr. Schmitt, of Nancy, France, was related at a meeting of the Paris Therapeutical Society, on May 9, last. In experimenting on both animals and man, he corroborates Prof. von Mering's results in the main, but he cannot acknowledge the pronounced effects he claims for it. He maintains that it has no real advantage over and cannot take the place of phenacetin.

Thilanin (sulphuretted lanolin), which heretofore has appealed to the dermatologists, has been practically unheard of during the past year.

Thioform is the name given to a combination of bismuth, sulphur, and salicylic acid, and known chemically as bismuth di-thio-salicylate. It occurs as a fine, light greyish-yellow powder, without taste or odour, and insoluble in water, alcohol, or ether. It

is applicable in the majority of cases as an efficient substitute for iodoform. It is remarkable for its drying property, and is claimed to be without toxic effects. It, however, is stated as being only slightly antiseptic, although Dr. J. J. Schmidt, of Frankfort-on-the-Main, Germany, claims it is of service as an intestinal antiseptic in 300 milligramme (about 4 1-2 grain) doses, three times a day.

It is especially applicable in cases of burns, ulcers, and gangrenous patches.

In ophthalmic practice, Dr. E. Fromm, of Germany, has found it very serviceable in conjunctivitis, purulent ophthalmia, and strumous ophthalmia in children.

It has pronounced styptic properties also, which have been well exhibited in operations for the extirpation of the eyeball.

It being odourless, it is not difficult to appreciate why it would be chosen in the above class of cases.

Nothing has been reported from practitioners in this country as yet.

Thiol—the German artificial ichthyol—is still a very efficient and considerably used substitute for ichthyol in dermatological practice.

Dr. N. K. Rüdneff has used a 20 to 40 per cent. aqueous solution in fourteen cases of erysipelas of the face and one of the leg in soldiers. On the whole, he concludes that it is of service in selected cases only.

Its price stands in the way of a more general and extended use.

Thiophene—the iodoform substitute—has been practically unheard of during the past year.

Thiosinamin (allyl-sulpho-carbamide)—the compound alluded to here last year as being resurrected by Dr. Hans von Hebra, of Vienna, Austria, as of service in the treatment of lupus has been further tested by Dr. Van Hoorn. In general, he confirms the statements of Dr. von Hebra as to its therapeutic effects, but he finds they are not constant. Much more marked improvement was noticed if the administration was continued in some severe cases than in those only slightly affected. This led him to observe that it is not to be recommended in cases where the lupus is confined to a small space, and that local treatment should be employed in all cases, in conjunction with the other mode employed.

Aside from the above confirmatory report, practically nothing has been published other than the manufacturers' appeals.

Thymol (officinal) is still being used to a considerable extent,

chiefly as an anthelmintic as heretofore, also somewhat in typhoid fever, but in addition it has been suggested as a more regular general intestinal aseptic.

Dr. Gallippe, of Paris, France, recommends the external use of the following mixture as a prophylactic in measles:

Thymol . . .	150 milligrammes	(about 2 1-2 grains)
Carbolic acid . .	5 grammes	(" 80 ")
Water	1 litre	(" 33½ f ℥ ")

Dr. I. Gouladzé, a Russian practitioner, has obtained good results in from six to eight weeks after the external use of the following liniment for the treatment of favus:

Thymol	2.5 grammes	(about 39 grains)
Chloroform	20.0 "	(" 5 drachms)
Olive oil	90.0 "	(" 3 ounces)

The same ingredients, but in the following different proportions, have been applied with success, night and morning, in the treatment of recent ringworm:

Thymol	2 grammes	(about 1-2 drachm)
Chloroform	8 "	(" 2 drachms)
Olive oil	31 "	(" 1 ounce)

Thyroid Extract and its uses have suddenly become subjects of very great proportions. The literature is simply overwhelming, and mostly in favour of its administration, with some marked beneficial results. It would be almost futile and surely tiresome to enumerate here the literature of the subject (quite a book might be written), but it may be stated that it continues to be pushed most vigorously in the treatment of psoriasis, different forms of eczema, even washerwoman's eczema and teething eczema in children, lupus, and other skin affections; in sporadic cretinism, exophthalmic goitre, some forms of syphilis, and very largely for myxoedema.

Glycosuria is reported to have been produced in some cases after administration, which naturally is found to be a drawback.

In obesity and exophthalmic goitre there have been unfavourable as well as favourable reports, some observers arguing against its use.

It may be profitable to quote here the following portion of a paper on "Animal Extracts," delivered by Mr. C. E. Stuart, B. Sc.,

at the recent Oxford meeting of the British Pharmaceutical Conference, and found in the *British Pharmaceutical Journal and Transcript*:[1] "Animal tissues in their normal healthy condition are aseptic, and it is therefore only necessary to pay the most scrupulous attention to cleanliness and antiseptic conditions to produce extracts which may be safely used. The required gland or organ must be dissected out from the body with knives and forceps which have been sterilised in the flame of a Bunsen burner, and the glass plates, glass mortars, measure glasses, scale pans, and every other article used must be cleaned with soap and water, and rendered aseptic by soaking in a 5 per cent. solution of carbolic acid, and rinsing with a plentiful supply of distilled water, which has been sterilised by boiling. The hands and arms of the operator should be scrubbed with soap and water, washed in the 5 per cent. carbolic water, and finally with sterilised water."

In making this thyroid extract, "the formula originally published by Dr. Murray is adhered to because it furnishes a preparation which is active, concentrated, and retains its activity for a reasonable time, and also because it is essential for the manufacture of a good extract that absolutely fresh glands shall be used. In preparing the glands it is best to get them cut from the freshly killed sheep, rather than to trust to the butcher to send them in at his convenience, possibly after a few days' delay. As regards the small cysts occasionally found in the lobes, the matter they contain is not pus, but seems to be of a fatty nature; they are, however, for the sake of caution, better left out of the extract. Hypertrophied lobes, such as may be met with from time to time, three or four inches long, should be rejected. The lobes after being cleaned from fat and connective tissue are sliced thinly and bruised in a mortar; for every lobe is added 1 c. c. of glycerin and 1 c. c. of sterilised water. The mixture is allowed to stand for twenty-four hours, and is then squeezed off through fine calico. The product measures 3 c. c. for every lobe, and is a thick, dull red, cloudy liquid. For hypodermic use water containing 0.5 per cent. of carbolic acid takes the place of the plain water. A powder which keeps well may be made by simply expressing the juice from the glands, mixing it with sugar of milk, spreading it in a thin layer on glass plates, and drying at 90° F. The weight of the dry powder may be made up to 1 gramme for every thyroid lobe employed. This is three times the strength of the liquid extract."

The investigation of the constituents and active principle of the

[1] Vol. xxv, p. 177.

thyroid gland has had results which are chiefly of a negative nature. According to Dr. Gourlay,[1] the thyroid extract contains :

1. A nucleo-albumin, coagulating at 50° to 57°, precipitable by magnesium sulphate, and also by water from the gland pounded up with salt.
2. Very little proteid.
3. No mucin, the nucleo-albumin having been mistaken for this.
4. No proteose or peptone.
5. Possibly a ferment.

Toluene (toluol) is now strongly urged in Germany as an efficient expanding medium for thermometers, and a patent has been secured there for such a thermometer. Toluene is methyl-benzene, obtained by the destructive distillation of woods of various kinds. It is a colourless, oily, highly refractive liquid, proposed to be coloured by anilin for the above use. It freezes at —20° C. (—4° F.) and boils at 111° C. (231.8° F.), and has five times the expansive power, and is cheaper than mercury. For some purposes then, within the above range of temperatures, it is looked forward to as a desirable substitute for the more generally employed substances.

Tolypyrin—an analogue of antipyrin, and recommended as an antipyretic—has received scant attention during the past year, except through the manufacturers, in spite of the inducement of being a cheaper article than antipyrin.

Tolysal (tolpyrin salicylate), the new antipyretic alluded to here last year, does not seem to have invited the attention which it was hoped it would from the favourable reports made upon it at that time.

Dr. Bothe, of Freiburg-in-Silesia, Prussia, appears to be about the only one of prominence who has pushed any further investigations. His observations have rather been in the direction of an anodyne. He has made use of it successfully in those insane patients who showed no form of excitement ; in cases of headache of the neurasthenical and hysterical type, and those of organic brain disease, especially in some cases where antipyrin was ineffectual. It apparently speedily allays the extremely painful sensation of pressure or constriction in such cases, thus permitting the refreshing sleep of a hypnotic. The recommended dose varies from 1.25 to 2 grammes (about 20 to 31 grains), anything less producing little effect in that class of cases. Its disagreeable taste may be masked by giving it in hot soup or in beer. It has occasionally

[1] Journal of Physiology, vol. xvi No. 1.

produced nausea when given on an empty stomach, and vertigo was noticed, but not when the patient was directed to remain on his back for a while.

Dr. Bothe urges further trials.

Traumatol, still another very recent substitute for iodoform, is chemically iodo-cresol, prepared by the action of iodine on oxytoluene. It is described as a fine reddish-violet precipitate without odour. Presumably it is intended to be dusted on the affected parts, but little is known about it either clinically or otherwise, for the above meagre description is all that appears to be obtainable at this time.

Trikresol is the name given to a new antiseptic prepared in Germany, consisting of a mixture of the three cresols—ortho-, meta-, and para-cresol—in the proportion of 35 per cent., 40 per cent., and 25 per cent. respectively. It is introduced to supersede carbolic acid. It claims to be superior to the latter on account of its being non-toxic (?), and freely soluble in cold water. It is as clear and colourless as water, with an odour like creosote. It is claimed to be practically free from carbolic acid, from the fact that it boils above the temperature at which the latter does.

Prof. Max Gruber, of Vienna, Austria, carried on a series of experiments on the solubility of the cresols, and established their comparative superiority. It is determined that from ½ to 1 per cent. is sufficiently strong for surgical practice.

Dr. M. Charteris, of Glasgow, Scotland, has also reported his results of an experimental research on this agent, and remarks that it may be "concluded that trikresol is a three times stronger germicide than pure phenol, and that it is three times less toxic. Its advantages, consequently, for surgical purposes are very pronounced, and in all probability some combination of it with an alkaline base will in the future be prepared, which may with safety and with profit be administered internally in specific infectious diseases."[1]

Dr. Robert Lee, of West Kensington, London, England, has experimented with it for inhalation, and remarks: "I find that trikresol follows the same law, as might have been expected, as carbolic acid, and that a mixture of one drachm of trikresol to one pint of water gives off, when boiled continuously, a vapour of the same strength as the mixture. This is rather strong for children, and a weaker solution may be used. To what important uses this

[1] The London *Lancet*, vol. i, for 1894, p. 801.

property of trikresol can be applied in the treatment of many maladies by inhalation, I hardly need point out."[1]

It has been little used in this country as yet, and as far as the old country is concerned there are few definite results to report, for the subject seems to be pretty closely confined to the arguments of the rival manufacturers of trikresol in Germany on the one hand, and of those of carbolic acid in England on the other.

No doubt more will be heard of this agent.

Trional (di-ethyl-sulphon-methyl-ethyl-methane)—the hypnotic allied both in composition and action to sulphonal—has had some adverse results charged against it during this past year. They, however, do not overbalance, by any means, the good results.

Dr. K. Rychlinski has made as many as 100 observations with it in doses from 500 milligrammes (about 7½ grains) to 4 grammes (about 62 grains), among which were comparative observations with sulphonal, chloral, and duboisin sulphate, and his conclusions may be summed up as being about the testimony of the majority of those who have used it: 1. It acts admirably, especially in cases of insomnia due to functional disturbances in the nervous system; 2. It does not in the least affect the heart's action even when cardiac disease is present; 3. It does not have a disagreeable taste, and is readily soluble in hot tea or milk; 4. Awakening from sleep occurs with no disagreeable sensations about the head; 5. The dose requisite to produce sleep is smaller than with other agents; and 6. On the whole, it should be preferred to all the ordinary hypnotics.

Tropacocaine (tropsin) has not received the attention during the past year which seemed justifiable to prognosticate for it when previously alluded to here. The only two prominent papers on the subject are those of Dr. T. J. Bokenham, M. R. C. S., L. R. C. P., of England, who reported rather favourably on its use as a local anaesthetic in ophthalmic surgery, and Dr. C. A. Veasey of Philadelphia, Pa., who used it in the same class of cases, and concludes as follows: "I have used it in some minor operations, but do not like it any better than the ordinary cocaine solutions; and as the price of the preparation is so high—being about forty cents a grain at wholesale—it is hardly probable that it will come into general use.

"For removing foreign bodies from the cornea, or for making strong astringent or caustic applications to the cornea or conjunc-

[1] The London *Lancet*, vol. i, for 1894, p. 1474.

tiva, it is preferable to cocaine on account of its feeble and infrequent action upon the accommodation, thereby preventing the annoyance of a hazy vision for a time; and in cases of keratitis, when an anaesthetic must be employed, it is to be preferred, as it does not diminish to so great an extent the blood supply.

"For other purposes I have not found it superior to the cocaine hydrochloride in general use." [1]

Tuberculin (parataloid) is still meeting with adverse criticism. Conflicting testimony continues to appear in the reports from all quarters. Even as a diagnostic agent opinions differ, and according to Dr. Henry, of Melbourne, Australia: Whereas it may be admitted that it is of value for this purpose as far as animals go, and some quite extensive experiments have been successfully completed in this line, both in relation to food-supply cattle and other animals, still, it does not follow that this should serve as a justifiable analogy to apply it in similar cases to man, for the reason that, in addition to the unmistakable dangers of its introduction into the system, the means of diagnosing pulmonary tuberculosis in man is already of such reliability as not to warrant such a risky procedure.

Dr. E. Thorner, of Berlin, Germany, has been one of the most persistent and enthusiastic experimenters on the therapeutic action of this agent. He appears to have guarded his steps as he proceeded in the way of excluding all probable discrepancies, and yet his results are called in question. When he read his paper before a local medical society, the discussion was rather adverse to his views. Professor Leyden stated that in his opinion only here and there could its very cautious use be permitted, and he was compelled to acknowledge that he could not share Dr. Thorner's opinions. Professor Ewald also took part in the discussion, and stated that as far as clinical and experimental testimony had gone, tuberculin possessed no specific action, and he felt inclined to believe that it would finally be abandoned owing to the dangers attending its use.

Prof. E. Koch has very recently reiterated his modified claim for this agent as being only of service in those cases where the tubercle bacillus alone was present, and that when the case was complicated by the presence of other microbes, it was not only of no service but often did harm.

Tuberculocidin (alexin)—modified tuberculin—has apparently received no attention whatever during the past year.

[1] N. Y. Med. Journ., vol. lviii, p. 632.

Tumenol—closely allied to ichthyol—has not been reported on during the year past.

Tussol is the more or less fanciful short name given to antipyrin amygdalate, and is recommended by Dr. Rehn, of Frankfort-on-the-Main, Germany, as giving in some respects better effects than antipyrin alone, especially in the treatment of pertussis in children, where it apparently not only reduces the frequency of the paroxysms, but mitigates their severity somewhat. It has been given dissolved in water to children as young as one year old, in doses of 50 to 100 milligrammes (about ¾ to 1½ grains) two or three times a day, and from this all the way up, in graded doses, to 500 milligrammes (about 7½ grains) four, five, or six times a day to older children.

Dr. Rhen is apparently the only observer of any prominence who has used it and reported upon it. It is unknown as yet in this country.

Urethane has been very little written upon for the past two years, but this is not due to its retirement from use, for it is still largely employed, especially as a safe, mild, moderate, and yet effective hypnotic in cases of insomnia not due to pain. It is rather risky to give many of the other hypnotics to children, but urethane has a good record in this regard.

Weights and Measures by the decimal (metric) system are still meeting with steady progress, which, however, may be considered slow by the impatient, but when it is considered that such a decided change is almost revolutionary to users of the old system, and that such are therefore rather obstructive than otherwise, the system really is seen to be making longer and longer strides forward every successive year, and the progress must be considered on the whole quite satisfactory.

By royal decree, on January 13 last (the beginning of their new year), the Russians were compelled henceforth to use the decimal system in preparing and dispensing medicines. Russia had been leading up to this for the past four years by requiring it to be taught in conjunction with their previous system in all their universities for that length of time.

At a recent meeting of the Council of the Pharmaceutical Society of Great Britain, Mr. Wm. Martindale offered the following resolution: "That after January 1, 1895, a practical knowledge of the metric system of weights and measures shall be required of all candidates for the minor examination in the subjects of prescriptions and practical dispensing, and that the board of examiners be

instructed to require from candidates a general knowledge of posology in terms of the metric as well as the British system of weights and measures as defined by the British Pharmacopoeia, 1885; and in practical dispensing 'to weigh, measure, and compound medicines' by the metric as well as the British system of weights and measures." This, however, was rather too severe a course for some of the trembling conservatives, and they therefore required the wording to be altered from a mandatory to a permissive resolution in the way of *requesting the consideration of the advisability of acquiring a practical knowledge, &c.*, before it passed the Council. The new system has rather a rough road to travel in Great Britain, and therefore enthusiasts must not look for anything like a complete accomplishment there for years to come.

It may assist some to glide gradually over from the old to the new system by repeating here a suggestion of a reasonable expedient adopted by Mr. C. H. Turver of Blackpool, England:[1] "Relative to the late discussion on the decimal system, may I say that I adopted some time ago, a simple system, which has saved us probably many awkward mistakes—*i. e.*, to drop the use of the signs ℈ and ℥ and the corresponding terms altogether, and copy all entries in prescription or receipt books in simple terms of grains and ounces; and, in addition, use instead of the scruple, half-drachm, drachm, etc., weights, for dispensing and making preparations, weights from one-half grain (I use the angular grain weight) to 10, 20, 30, 50, 100, 500, 1000 grain weights—a weight of 60 and one of 120 grains are also useful. We are all of us familiar with the dangerous similarity there is in some prescriptions between the signs, as well as the illegibility of the Roman numerals, but a quantity written, say, gr. 150, instead of ℥ iiss., could scarcely be mistaken, even when written hastily. As for the indications of quantities, by using the signs ℨ j, ℥ iij, ℈ j, gr. 2—well, they are neither more nor less than a relic of mediaeval darkness. My apology for mentioning such a trifling matter must be that of having met so many chemists who have appreciated the scientific simplicity of the method I suggest. It is devoutly to be hoped that the forthcoming edition of the Pharmacopoeia may have the metric system introduced, at any rate as an alternative system. It is intolerable that Great Britain alone should be without a scientific system for estimating quantities when all the civilised world has adopted one. I am sincerely sorry for those members of our craft who—having allowed themselves to get out of touch with modern

[1] British Pharm. Jour. and Trans., vol. xxv, p. 70.

scientific refinements—are unable to grasp this simplest of systems, which even our school children are familiar with. But, in spite of these persons, we who have used the metric system and enjoyed its benefits, ought not to be deprived thereof any longer."

Winslow's (*Mrs.*) *Soothing Syrup.*—After so many years of persistent contradictions on the part of the enterprising firm offering this proprietary medicine, that there was no morphine or opium in their preparation, notwithstanding that a certain analysed sample proved its presence, the promoters, desiring *to remove exaggerated misapprehensions*, (*! ! !*) now magnanimously (?) make the important announcement that the exact proportion of morphine is eight milligrammes (one eighth of a grain) to 30Cc. (1f$\overline{3}$), thus making the maximum dose one milligramme (one-sixty-fourth of a grain).

MEMOIR OF JUDSON BOARDMAN ANDREWS, M. D.

By William D. Granger, M. D., of Westchester County.

Judson Boardman Andrews, M. D., a founder and former president of the New York State Medical Association, died at his home at the Buffalo State Hospital, Buffalo, N. Y., on the third of August, 1894. He had been for fourteen years the superintendent of that institution.

Dr. Andrews was born at North Haven, Connecticut, on the twenty-fifth of April, 1834. He was of an old New England family. William Andrews came from England to New Haven in 1635. Generation followed generation in honourable succession, and of this line Dr. Andrews was born. On his mother's side he had a direct descent from a brother of Elihu Yale, the founder of Yale College.

His father died in his son's earlier life, but he survived his mother a few years only. She was a woman of gentle disposition, kind and generous to all, of firm religious convictions, yet catholic to others. She exercised over her son a salutary influence; his early training at her hands must have been most judicious, while his own lovable traits, his high conceptions of truth, honour, and uprightness, were undoubtedly inherited and fostered by her in his earlier years. His devotion to her in his manhood was constant, and she received from him all the return a true son could give.

Dr. Andrews had not the early advantages of wealth. He laboured by teaching for his education, and his life was one of constant activity and labour, nor did he leave an independent estate. But his generosity was unceasing.

A brother died in early manhood of consumption, leaving a family of young children. As they grew to partial maturity one after another died of that dread disease. Their care was to him a sacred trust, willingly performed, but, like his other deeds of kindness, done so one hand knew not what the other did.

I speak thus early of these traits of character because they influenced his whole life, both public and private. He was kind, unselfish, generous, and helpful. He had also a high sense of his moral obligations; he was richly endowed with a pleasing address, a distinguished and delightful bearing, a noble and commanding presence. These qualities, combined with an experience gained in many fields of active labours, as well as a practice gained in his profession and specialty by years of service in minor positions of trust, made him an ideal physician when, at a mature age, he took charge of an institution that was to be till the end the culmination of his life and work. In fact his whole life and training,

prior to his going to Buffalo, seemed to be for the purpose of fitting him for his special line of work, to prepare him for the responsibilities of that position.

His honourable efforts at self-help endowed him with a feeling of confidence and independence. While as a student and teacher, as a soldier seeing active service during the Civil War, and as a physician, with his many years in one of the oldest and most noted of the asylums under the direction and training of one of our ablest superintendents, he matured and broadened, his character grew; he was disciplined in many schools and injured by none; he learned to obey and command. Whatever he may have lacked he became by all this varied experience a man in the best and broadest sense of the word.

The outline of his life runs as follows: Born in 1834. He received his education in the public schools of New Haven, and entered Yale College in the class of '55, and was duly graduated. He then taught school until he entered the Jefferson Medical College of Philadelphia in 1857, taking one lecture course. Then he resumed teaching until 1861, when he enlisted in the Union army and was elected captain of Company F, 77th Regiment, New York Volunteers. During the Peninsula campaign before Richmond, his health was seriously undermined and he was obliged to resign in July, 1862. He resumed his medical studies and received his degree in medicine from Yale Medical School, February, 1863. He at once entered the Germantown Hospital as medical cadet. In July, 1863, he was commissioned assistant surgeon in the 19th Connecticut Volunteers, afterwards the 2d Connecticut Volunteer Artillery. He remained in service till the close of the war, and was mustered out with the regiment in September, 1865. Both as a company officer and as surgeon he saw continued active service, and was in many important campaigns and engagements. Later, in civil life, he was a member of the Grand Army of the Republic and the military Order of the Loyal Legion.

Like many young men Dr. Andrews, then in his thirty-second year, found himself at the close of the war without a settlement, having neither a home nor established in his profession. At first he entered into private practice, but in 1867 he accepted the position of third assistant physician in the New York State Lunatic Asylum at Utica, then under the superintendency of the late Dr. John P. Gray. In 1871 he became first assistant. In 1880 he was appointed superintendent of the then unopened Buffalo State Asylum, Buffalo, N. Y., and entered into office in October of the same year. He was, after going to Buffalo, first lecturer and afterwards professor of psychological medicine in the medical department of Buffalo University, and resigned his position in 1893. In 1886 he was president of the Erie County Medical Society. He was a member and founder of the New York State Medical Association and its president in 1892. In 1887 he was president of the section of psychological medicine and nervous diseases of the Ninth International Medical Congress which was held in Washington. He was the first president of the American Medico-Psychological Association, a direct outgrowth of

the Association of Medical Superintendents of American Institutions for the Insane.

He was an active Mason for many years, and he received honourary membership in the thirty-third degree of Scottish rite Masonry. He married Agnes, daughter of Hon. Samuel Campbell of New York Mills, N. Y., a suburb of Utica. She with one daughter survives him.

Preëminently Dr. Andrews's life work was in the institutional care of the insane. He entered into this work, as we have seen, later in life than do most men, but remarkably well fitted for his peculiar occupation. Promotion came slowly, and for ten years he filled most ably a minor position. With all the qualifications for a superintendent he performed the details of his work during these years most faithfully. They were not misspent, but, like his many years of varied training, fitted him thoroughly for his more responsible position, and gave him a reputation enjoyed by but few of his superiors in office. For ten years he was the working editor of the *American Journal of Insanity*. Although much of his work is not to be recognised, his articles that were signed drew to him the attention of co-workers. In 1871 he published an article on chloral. This was the beginning of a series of articles, mostly upon new hypnotic remedies, and they were continued until 1886. When getting ready for these articles it was Dr. Andrews's habit to take the drug himself or give it to some other healthy person, and in increasing doses. For instance, chloral was increased to a dose of sixty grains. The condition of the person taking the drug was noted, both before and after its exhibition, and also the effect of the medicine. He also gave an extended experience based upon the use of the drug on patients, and also a review of the literature of the subject. In this way he wrote upon "Phosphoric Acid," "Chloral," "Paraldehyde," "Nitro-Glycerin," "Jamaica Dogwood," "Fluid Extract of Camella," "Hyoscine Hydrobromate," and "Urethan." He wrote several other papers while at Utica, largely reports of special cases and studies. One, however, on "Asylum Periodicals" is of general interest and historic value. After going to Buffalo his publications were upon broader topics. One was upon the "Early Indications of Insanity," in 1879, before the alumni of Buffalo University. Before the Erie County Society, in 1886, as president, he reviewed the subject of the "Increase of Insanity." His address as president of the psychological section in Washington, 1887, upon "The Distribution and Care of the Insane in the United States" was the most thoughtful and careful in preparation—although his address as president of the American Medico-Psychological Association, Chicago, 1893, must rank next in value. It was really another review of care of the insane in the United States. This was his last public appearance, and in it he speaks from the fulness of his rich experience. Dr. Andrews was both conservative and a man of progress. With him nothing was to be retained simply because it was a custom, nor discarded because of fashion or public clamour. On the other hand nothing was to be accepted because it was new and because enthusiastic heralds shouted its praises, nor rejected because of an unwillingness to receive and

learn a new thing. He was a most willing learner, his whole life at Buffalo was one of advancement. But all changes were slowly, thoughtfully, and considerately made. He had the utmost respect for the views of all men of experience and good judgment, but lacked patience with the fleeting advice, or the enthusiastic opinions of the reformers. It is in this light his address at Chicago is to be considered, and so it must be considered when he said: "The progress made has been pronounced and gratifying, and it is manifest in every department of hospital work." Time will not allow me to review this address, but his conception of what an asylum, or rather, to use his words, hospital should be, deserves notice. He says: "All the institutions, by whatever name called, are conducted as places for the care and cure of the sick, rather than for mere detention of the insane." But years before, in his report to the legislature in 1883, he used the following noble words and enunciated a great truth. I cannot but quote him in full because it reveals better than any words of mine Dr. Andrews's conception of his life work exemplified in his daily life. "Like a general hospital the field of an asylum is not only for the employment of curative measures, but the care of such as are hopelessly sick. These cases often call for more sympathy as they demand more constant and personal care. The good accomplished by charitable institutions is too often and unjustly measured by the number of recoveries reported. The record would be more just and give a better exhibit of the real labour of charity performed if the deaths and unimproved were counted instead of the recoveries. In many of these cases there is more time and money spent in nursing, more patience and sympathy exercised, and more suffering alleviated, than where recovery rewards treatment. We are not apt to take this view of the subject, but to measure success to the number restored to friends and to their places in the field of active exertion." He closed his Chicago address with burning words against political interference in hospitals for the insane. Flagrant examples of this pernicious practice were near at hand, the state of Illinois furnishing the last and most striking. We have, he says, the "unseemly sight of strictly professional places being parceled out as a reward of party service." While "years spent in building up these noble charities, reputation for scientific attainments, or for executive ability, which redound to the honour of the state are of no avail against the clamour of the spoilsman." His remedy is by substituting the "merit" for the "spoils system," which is, he says, the foundation of the civil service system.

Dr. Andrews's years at Buffalo were laborious, but of ever-increasing usefulness. He grew and broadened, and he was as receptive at the end as at the beginning. In the care of his charge, his first interest was always for his patients. No duty, however pressing, drew him from them. If possible, he received each case, and if not, at once made himself thoroughly informed regarding it. Literally he knew each patient. He had a remarkably accurate knowledge of insane conditions, and applied this knowledge with rare skill to each individual coming under his care. His influence over his patients was marked, and to an unusual

degree he won their confidence and was helpful to them in return. No patient was too unimportant for his kind attention. Early in his service I remember a most forlorn and entirely friendless woman came to the asylum through the agency of the police and other officials. After she was taken to the ward, he turned to me and said, "She seems to have no friends; it's our duty to see that she finds friends here." His sense of responsibility for those under his care was very strong. Again, early in my relations with him, as I sent a new patient to the wards, he said, "I want you never to forget, when you turn your key on a patient, the deep responsibility assumed by you in depriving that helpless person of liberty." Such remarks may seem trite and formal in repetition, but to him they were of constant application, living and guiding truths.

The most important work of Dr. Andrews at Buffalo was the establishment of a training school for nurses. More good, I think, grew out of that act than any other. Education of nurses meant to him improved methods of care and better nursing of the sick. From this training came the almost entire disuse of methods of restraint, and the entire disuse of the covered bed. The last time I visited the wards of the Buffalo hospital with Dr. Andrews, he pointed out many changes that had taken place, told me of many new methods of care and nursing; of the enlarged liberty he was able to give patients; of the many new industries introduced, and gave the credit, not to himself and his superior efforts, but to the training school.

Systematic instruction to attendants was begun at Buffalo in 1883, and from the first it received Dr. Andrews's cordial support. In 1884 the trustees formally adopted the school and regulated its conduct. Prior to this effort instruction had been given, unknown to us, in one institution in America and also abroad. The Buffalo movement showed for the first time the utility of such a school in a public state institution, and was in every way, both in conception, methods, and influence, a pioneer effort. Equally so were the other efforts mentioned, and they had the credit as well of priority of date. At the present time training schools are conducted in almost all American hospitals for the insane.

In the earlier years at Buffalo, Dr. Andrews freely used the milder forms of restraint. He thought much upon the subject, and materially modified his practice, using in his later years but very little. He wrote little upon the subject, for it was always a vexed question, and he was not a controversialist; but his address at Washington shows his views upon this subject: "The position of the profession in America, as I interpret it, is, that the employment of some forms of mechanical restraint is legitimate." And further declares, "It is not to be ruled out by the tyranny of public or official opinion." But trained nurses, increased in numbers on the ward, enabled him to practically abolish it, while an enlarged and trained night service did away with the covered bed.

From the beginning employment was a prominent feature, which grew in usefulness and broadened in its scope, and was at last carried to a high degree of perfection.

Dr. Andrews cared nothing for the work of his patients, considered simply as work. It was to be used alone for the good of the patient, and was part of a larger scheme embracing all kinds of employment and amusement, and its application was as varied as the individual and his changing conditions. In 1882 a day school for younger patients was established. Before his death he completed a home for women nurses, which had a room set apart for this school and another for the training schools. His views upon treatment, both medical and moral, upon parole and personal liberty of patients, upon work and employment and amusements, upon the training of attendants, are ably set forth in his annual reports. The central idea is, that insane hospitals are places for treatment and care; the cure of the disease to be sought for unceasingly, while every effort is made to alleviate the unfortunate condition and to lessen the suffering of the insane.

Dr. Andrews visited Europe in 1889, and wrote in his next annual report some of his observations and made some reflections. He says,— "Occupation is employed to the fullest extent compatible with the physical condition of the patient, and the question was sometimes forced upon one . . . whether it was not given too great prominence, and whether the hospital idea is not in danger of being relegated to a secondary position." And further, he says,—"When those in charge of institutions claim special credit for the small number of doses of medicine employed, and the small size of the bills for apothecary supplies, the thought will naturally arise whether they are doing their whole duty as physicians. More thorough medical treatment has some advocates. It is well, in these days, when the practical and economic side is so often presented, for us to recall the fact that we have to deal with the sick and the feeble . . . and not with a class of people who only need some continuous occupation and employment. Many of them have had too much of this already, and their great want is rest."

Dr. Andrews took a very material and practical side in his views of insanity. To him it was always a disease. In his reports of causes he makes little mention of so-called "moral causes," even as an auxiliary cause. It is entirely the physical causes he estimates in producing insanity. So in his treatment the physician had the first place, and medicines were to be used as the first means of treatment. Methods of care, occupation, labour, and the thousand and one matters of detail were of necessity, however important, secondary. His training of nurses was to get, first, better medical coöperation, and, second, better personal and ward supervision. In both he was remarkably successful. His knowledge of insanity was widespread, acquired by careful and extensive reading and by personal study of thousands of patients. His judgment in prognosis, and, in fact, of the patient's future, was unusually accurate; his diagnoses in difficult cases, sound and correct. He read his patients, as it were, instead of spelling out minor symptoms. He took a broad view of each one's condition rather than a narrow inspection of many details. But he was very studious and careful in each case, and especially in cases that were difficult and complicated. He

was, however, slow in coming to a conclusion, and it should be said of him that this was his habit of dealing with all questions that came before him. He was also able, and always willing, to revise, for any good reasons, an opinion already formed.

Dr. Andrews's views upon the subject of insanity, while not narrow, were eminently practical and simple. His mind was not speculative or metaphysical in its methods, study, or application; it was direct and positive. Although born and bred in New England, he absorbed none of its transcendental ideas so prominent in influence half a century ago. He had seen many "isms" rise and fall; he knew all the "manias" of the catalogue. But the presence of insanity to him was a terrible reality, and he at once turned all his mental resources to succour and help. He had no sympathy with those who floundered and delayed in attempting to fix a name to a given case. Often have I heard him, when asked "What do you call this case?" say, "I have no title to give, but certainly the person is insane."

Dr. Andrews was in full sympathy with all studies that enlarge our knowledge of insanity, and all true and healthy effort had his earnest support. His teaching partook more of the nature of a protest against extravagant theory, or metaphysical speculations; against new classifications, based too often upon ingenious divisions of the subject; against the latest fashion, the newest fad.

Dr. Andrews was a firm advocate in favour of enlarging the teaching of the subject of insanity in medical schools, and saw great advance in this direction. He advocated, from the first of his going to Buffalo, the use of the wards for clinical teaching, and had, at last, the satisfaction of seeing this method in operation in his home institution. He was an earnest supporter of state care, lately adopted and put in operation in New York state. If asylum physicians are subject to the charge of being confined too much to their institution, too much absorbed in their special work, Dr. Andrews, by precept and example, disproved the truth of this assertion. He was active in all professional work in his city, county, state, and nation. He was also an active citizen, interested in all the higher departments of social and political life.

Dr. Andrews was frequently called upon to give expert opinions in medico-legal cases; but he always declined all offers in strictly private cases, however tempting the pecuniary reward. In important legal cases, when life was at stake, he sometimes acted. He demanded perfect freedom in investigating in his own way everything connected with the case, and perfect independence in forming a judgment, even to changing his opinion, if he thought best after hearing evidence in court on either side. On the witness stand he was perfectly impartial, as fair with the lawyers in opposition as with those of his chosen opinion. He reported two cases of murder trials from the medico-legal point of view. The case of Louis Peter Otto[1] is a masterpiece of study and analysis. It was a most difficult and perplexing case of feigned insanity from the murder to the gallows. Dr. Andrews, with rare skill, untied the knot,

[1] American Journal of Insanity, October, 1888.

and convinced both professional brethren and laymen that the accused was shamming.

Dr. Andrews's literary style was plain, simple, and direct. He never wandered from his subject, never required his readers to read him twice to understand what he had to say. He never attempted to display his knowledge, but chose his words with studied skill and framed his language in chaste and polished phrases.

He was frequently asked by Governors Cleveland and Hill to examine persons condemned to death, for whom clemency was asked on account of insanity. He made careful examinations and full reports, and his conclusions were always accepted by the executive.

If I was to characterise his strongest moral and mental trait, I would say it was his love of truth for truth's sake. To an unusual degree there was an absence of all duplicity in his character. He never timed his opinions to public clamour, nor formed them with a view to a passing expediency. He sought, with an enlightened conscience and understanding, for the truth involved in any question at issue, and studied to make his judgment and conduct rightly accord therewith.

Of his private life little need be said. It was reflected in all his public positions. Generous by long habit, genial by natural kindness, loving much and giving much. Of a pure heart, and a childish faith in the goodness of others that no experience could fully down, he was the type of a Christian man whose heart had embraced truths nothing could change.

Dr. Andrews's health first failed in 1889. He strove against it, and fairly conquered, but a year before his death complications arose. He was a man of untiring energy and an enduring capacity to do long and arduous labour with little fatigue. He carried his own burdens easily and many others as well. Slowly, but surely, he lost his life; happily ended, after a prolonged absence, at the home of his choice, under the roof where his best labours for God and humanity had been accomplished.

The funeral was at New York Mills, where, wrapped in the flag he loved, he found his everlasting resting place. Rev. Prof. Orin Root, of Hamilton College, a life-long friend, made an address, from which I would quote the following tribute:

"I do not know Dr. Andrews's creed; perhaps he never phrased one. It might have been that of Richter, 'I love God and little children, not little children in years only, but the grown children, lost and crying in the night of their blinded interests.' I can believe that the moans of the wounded and the dying on the field and in the hospitals of his earlier years aroused a purpose never lost to save suffering humanity."

MEMOIR OF M. K. HOGAN, M. D.

BY WILLIAM O'MEAGHER, M. D., OF NEW YORK COUNTY.

Dr. Michael Kelley Hogan was born, in the year 1830, at Ballyvalley, near Killaloe, county Clare, Ireland, of a highly respectable family of the farming class. Among his immediate relatives, in the past and present generations, were two bishops, several minor church dignitaries, and five doctors—an uncle, two cousins, a brother, and himself. His mother was a woman of refinement and great piety, and, as usual, transmitted to her children some portion at least of her own characteristics. The family residence on the banks of the Shannon, was a beautiful home, surrounded by the most charming scenery.

In such a family education was an instinctive want—a paramount duty, and, accordingly, the youthful members received the best attainable, as far as means permitted. The subject of this sketch thus laid the foundation of a good, practical education in grammar, history, literature, classics, and mathematics.

At the age of twenty he came to New York and began the study of medicine, under his cousin, Dr. Flannery, attending lectures at the College of Physicians and Surgeons, and graduating with marked distinction, in 1858, thereby attracting the notice of Professors Clark, Dalton, Watts, and others, who never failed, afterwards, to extend to him a flattering, friendly recognition, invaluable to the young, unknown practitioner. Shortly after graduating he was appointed one of the resident physicians of the New York Hospital, where he had the advantage and opportunity of acquiring practical medical knowledge, under the eyes and auspices of his late college professors, and of such men as Joseph M. Smith, John Watson, J. H. Griscom, Halstead, and others equally eminent. And that he availed himself of these great advantages is evident. His spare time was devoted to study and experiment, especially vivisection, and to show his practical originality, at this early period, I venture to quote from "A Treatise on Wounds of the Intestines," an extract from which was published in the *New York Medical Press*, June 18, 1859, in which he proposed to exsect the injured portions and unite the sections by continuous suture. He said, "I am not aware that the removal of injured portions of the intestine has been practised or even suggested, and seeing the necessity for such an operation, I operated on dogs. From one, on July 6, I exsected eight (8) inches of the small intestine, uniting the cut edges by continuous suture, and from the same dog, August 12, exsected the united section. Some of the sutures could be seen, in process of detachment in the gut. There was not much local peritonitis, but some slight adhesion of adjacent portions of the intestine."

After serving a full term at the New York Hospital, Dr. Hogan was appointed acting assistant surgeon, U. S. Army, May 21, 1862, serving with the Army of the Potomac and on hospital transports, in the vicinity of Washington. He was next appointed assistant surgeon of volunteers, September 2, 1863, and surgeon on the ninth of the same month; served, in that capacity, in Washington, attending sick officers, until April, 1864; was surgeon-in-chief, First Division, Ninth Army Corps, up to September, 1864, when he was detached to the Artillery Brigade of that Corps, and again resumed his place as surgeon-in-chief, First Division, Ninth Corps, up to May 9, 1865; in the same capacity he served in the District of Washington, up to August 19, 1865, when he was transferred to the Bureau of Refugees, Freedmen, and Abandoned Lands, with which he served until mustered out, November 1, 1867. His military service was marked by great executive ability, untiring energy, and conscientious discharge of duty to the sick and wounded, and to the government.

Returning to New York he started at once to practice, but found it very slow work, because the city was over crowded with medical men—those who had prudently remained at home, leaving to others all the honour, glory, and dangers of the battlefield, and those who, having had more than enough of military glory, hardships, and exposures, came back to find every nook and corner occupied. The colleges had been turning out hundreds of graduates, to supply the army and navy, and the places of those who had entered both branches of the service, so that it was extremely difficult for the disbanded volunteer surgeon to get either a foothold or recognition, especially if he was a stranger without acquaintances or friends. Some were glad to become substitutes in the dispensaries and hospitals, but when the assistants sought a well earned place, when a vacancy occurred, they were incontinently told to stand aside to make room for a medical or surgical gosling fresh from the incubator. But Dr. Hogan was fortunate enough to secure an appointment as pension examining surgeon, which he held for several years, and in 1870 he was appointed visiting surgeon to St. Vincent's Hospital, and in the same capacity to Ludlow street jail, for federal prisoners. Thus he was constantly occupied in hospital and private practice, with very little time to spare for scientific or literary diversions. His aim throughout life was to be useful rather than ornamental, a conscientious rather than a brilliant worker. Precise, punctilious, reserved, retiring, cool, and cautious, he was also genial, social, generous, and amiable; cold, dignified, and impassive, he was also active, vigilant, and self reliant; tolerant and courteous to a marked degree, he was as firm as a rock in maintaining his own views and opinions; his language always well selected, terse, and incisive, was never pedantic or affected, but with all his well marked personality, firmness, confidence, self reliance, and acknowledged excellence as a medical practitioner, he rarely excited animosity or offensive rivalry among his compeers and confrères, and generally succeeded in securing their respect and esteem. Up-right, honourable, and moral, he was not a pretentious model of excel-

lence, and seldom condemned deviations from rectitude, except in duty bound to condemn the sin while pitying the sinner. His religion he kept in the inmost recesses of his own bosom, and never questioned the belief of others. He was intensely American in thought, word, and act, and in politics an ardent, ideal, patriotic Republican; an enthusiastic advocate of human liberty everywhere, and a devoted friend of the American negro to whom he rendered valuable service when he was attached to the Freedman's Bureau.

Dr. Hogan's personal appearance was striking and prepossessing. Of the middle height, squarely built, with good figure, shapely limbs, and graceful carriage, a fine, intellectual head, lofty brow, regular, clear cut features, blue-gray, large, expressive eyes, aquiline nose, well formed mouth, and chin indicative of firmness and determination. He always dressed with care, neatness, and unostentatious simplicity.

He died on the twenty-fifth of February, 1894, of a chronic affection of the larynx, which was at first a simple papillary growth but by neglect became malignant. Attended by his able and trusted colleagues, Drs. Charles Phelps and J. W. S. Gouley, who did all that human skill and devoted friendship could do to save his life by operations and incessant care, he quietly sank into the final sleep that knows no earthly waking, February 25, 1894.—R. I. P.—

MEMOIR OF WILLIAM GOVAN, A. M., M. D.

BY IRVING D. LE ROY, M. D., OF DUTCHESS COUNTY.

This Association is again called upon to chronicle the death of one of its Founders, William Govan, M. D. This event occurred on March 22, 1894, at his late residence in Stony Point, N. Y. It is eminently fitting that our Association should pause in its proceedings to offer a tribute to the good qualities and worth of its deceased Fellows.

The subject of this sketch was born in Barnet, Vt., August 12, 1818, of Scotch parentage. His early ancestors, dating as far back as the seventeenth century, were prominent in the civil wars of that period, in defense of civil and religious liberty. His grandfather, William Govan, was a prominent citizen of Glasgow, Scotland. His father, Andrew Govan, was born in Glasgow, graduated from the University of Glasgow, emigrated to America in 1815, and settled in Vermont.

Dr. Govan's early education was obtained in the public schools of his native place and Kimball Union Academy of Meriden, N. H. In 1835 he entered Dartmouth College, from which he was graduated in 1839. For a year or more he was an instructor in the academy at Peekskill, N. Y., after which he commenced the study of medicine. He became a licensed practitioner in 1843, and located at Stony Point, Rockland county, N. Y., where he remained until his death.

In 1844 Dartmouth College gave him the degree of A. M., and in 1854 he received the degree of M. D. from the New York Medical College. His membership in several societies, local and national, shows the lively interest he took in his profession, and the frequency with which he was called upon to fill offices of public trust attests the appreciation in which he was held by those who knew him best. He was a prominent member and an ex-vice president of the New York State Medical Society; a permanent member of the American Medical Association, and a Fellow of the American Academy of Medicine. He was also a member of the New York State Board of Health; coroner for Rockland county; a volunteer surgeon during the Civil War, and surgeon of the Seventeenth Regiment, New York State Militia; president of the board of pension examiners and the board of education of Stony Point, N. Y., and a member of the Masonic and Odd Fellow orders, which orders officiated at his funeral.

Dr. Govan built up a very extensive practice, which extended over the northern part of Rockland county. He married Lucia J. Mitchall, daughter of the late Chauncy R. Mitchall of Peekskill, N. Y. One son and a daughter survive him.

The large and sympathetic audience which gathered at his funeral

gave silent testimony to his great worth as a physician and Christian gentleman. His life was a noble, pure one, and his presence and skillful counsel will be missed from many a household and by a large circle of friends and professional acquaintances.

Requiescat in pace.

MEMOIR OF NATHANIEL M. PERRY, M. D.

BY JOHN C. JAMISON, M. D., OF STEUBEN COUNTY.

The late Dr. Nathaniel Mallary Perry was born February 26, 1817, in Troupsburg, Steuben county, N. Y., and died April 3, 1894, at his residence in the town of his birth, being seventy-seven years of age. His ancestors were originally from England. He sprang from a patriotic stock, both his paternal and maternal grandfathers served as soldiers in the Revolution of 1776. His father settled in Troupsburg, N. Y., in 1808, and cleared up a farm from the primitive woods for a home and raised a family of seven children, and of this number the subject of our sketch was one. At the age of twenty-one he attended the Middlebury Academy at Wyoming county, N. Y., remaining there until he completed an academic course, when he returned to Jasper, N. Y., and entered the office of Dr. Wm. Hunter for the study of medicine. He graduated at Geneva Medical College in 1845, after which he opened an office for the practise of his profession in the town of his birth. He had practised nearly fifty years when he died. At different times he performed the duties of superintendent of schools, supervisor, and one term in the legislature of the state of New York (1851). He was master of McClellan Lodge, No. 649, several terms, and a member of several medical societies, the most prominent of which were the New York State Medical Association and the American Medical Association. In closing this short memoir we will add the following quotation from a former historian of Steuben county, namely,—"All in all, Dr. Perry is a man of broad charity, sound judgment, high character and integrity, a representative man in the worthiest sense of the term, and an aid in building up and advancing the best interests of society."

MEMOIR OF WILLIAM THOMAS WHITE, M. D.

BY JOHN SHRADY, M. D., OF NEW YORK COUNTY.

Dr. William Thomas White died at his late residence, 130 E. 30th St., New York city, September 17, 1893, of cardiac hypertrophy, with degeneration of the heart's walls. The eighth in descent from John Howland and Tristam Coffin, both of the Mayflower, and the eighth also from Christopher Hussy and George Bunkor, he was born in Richmond, Me., July 7, 1829, and obtained his medical education in the Medical School of Maine and at the New York Medical College, graduating from the latter in 1855, and served as an interne in the hospitals on Ward's and Blackwell's Islands, N. Y., during that year and the next. He became demonstrator of anatomy at the former school, under the late Dr. E. R. Peaslee.

He served three and a half years in Panama, U. S. Colombia, and five years at Aspinwall, U. S. Colombia, as surgeon-in-chief of the Panama railroad, acquiring much experience among large bodies of men, and a critical knowledge of the Spanish tongue. By reason of the latter qualification he became a leading physician in the Spanish and Cuban colonies of the city.

In 1865 he settled in New York city, and since 1867 resided in the house in which he died. For the past twenty-six years he was a Fellow of the N. Y. Academy of Medicine, being its recording secretary for seven years, and its vice-president for two years. In 1876 he was elected orator, and delivered the annual oration in November of that year. For twenty-seven years he held membership in the N. Y. County Medical Society. He was also a trustee of the N. Y. Genealogical and Biographical Society; a member of the American Medical Association; one of the founders of the N. Y. State Medical Association; and of the N. Y. County Medical Association, being the vice-president of the latter for two years. He also had an abiding interest in the N. Y. Physicians' Mutual Aid Association; the N. Y. Medico-Historical Society, being its president for six years; and one of the board of managers of the N. Y. Society for the Relief of Widows and Orphans of Medical Men. Likewise he was a member of the N. Y. Medical Journal Association from its origin to its dissolution.

Dr. White held the position of attending surgeon to the De Milt Dispensary for fifteen years; that of visiting surgeon to the Presbyterian hospital for three and a half years, and to the City hospital on Blackwell's Island for the past seventeen years, and also for the past twenty-one years was attending physician to the Home for the Relief of Respectable Aged Indigent Females of New York.

He was the editor of the *Medical Register*, New York, New Jersey, and Connecticut, for the past fifteen years, and the president of the N. Y. College of Veterinary Surgeons for the past ten years.

In May, 1860, he married Eveline J., daughter of the late Jeremiah Springer, Esq., of Litchfield, Me., who died October 12, 1885, leaving three daughters. In November, 1887, he married Mary A., daughter of the late Capt. James D. Barstow, of Bath, Me., who, with his daughters, one of whom is the wife of Dr. C. E. Stammler, of Brooklyn, another the wife of Robert L. Brackett, and the other unmarried, survive him.

Dr. White was widely known in the profession for his integrity, candour, and hatred of shams. His industry partook of the marvelous, often taxing to the utmost his robust constitution, without in the least disturbing his equanimity. At no time without an official position in some association, dispensary, or college, he still conducted a large, if not lucrative practice, besides giving his best work to the *Medical Register*, which he characterised as the pet duty of his life. In all his multifarious projects, despite their vexing embarrassments, he preserved his amiability without suspicion of artifice or hypocrisy. A certain knowledge of human nature kept him aloof from many pitfalls, and proved in the end the correctness of his discriminations. Neither slow nor precipitate, his judgment stood him in good stead for more showy and less substantial qualifications. His reticence often passed for shrewdness, whereas it was due to modesty, and an aversion for giving offence. Thus often touching without mingling, bearing the burthens of life meekly and unflinchingly, waiting for no reputation to die, and plodding wearily, though silently, he carried the ornamental virtues of philanthropy, self-sacrifice, and charity

"E'en to the verge of the churchyard mold."

BIOGRAPHICAL SKETCH OF JOHN YOUNG, M. D.

BY C. M. KITTRIDGE, M. D., OF DUTCHESS COUNTY.

Dr. John Young, son of Dr. Charles Hamilton Young, and grandson of Dr. William Young of Ireland, was born in county Antrim, Ireland, April 16, 1822. He came to this country with his father, who settled in Cold Spring, November 17, 1826. When but a lad of thirteen years his father died. He commenced the study of medicine in New York city in 1838, and was matriculated at the College of Physicians and Surgeons in 1841, and graduated from that institution in 1844. He practised in Cold Spring for several years, and then removed to New York city, where he was a successful practitioner for twelve years. He came to Fishkill-on-Hudson in 1867, where he resided until his death.

In 1875 he went into partnership with his brother, Dr. William Young, at Cold Spring, and retained his practice while his brother went abroad.

Dr. Young was a Fellow of the New York State Medical Association, being one of its original members, and was a member of the executive committee for the Fifth District from 1885. He was for many years an honoured member of the Medical Society of the County of Dutchess, and was honoured and respected by his colleagues. He was a man of sterling character, and strict integrity, beloved and respected by all who knew him.

Dr. Young was taken ill August 27, 1893, and died of pneumonia after six days' illness (September 2, 1893). He was surrounded by a loving family, and closed peacefully a long and useful life.

REPORTS OF THE DISTRICT BRANCHES.

FIRST DISTRICT BRANCH.

The tenth annual meeting was held at Hotel Warner in the city of Amsterdam on July 25, 1894.

The secretary called the meeting to order, in the absence of the president, and on motion, Dr. J. C. Hannan, of Rensselaer county, was elected to serve as chairman.

The minutes of the last annual meeting were read and approved.

The attendance was small but the session was interesting and profitable.

The president's annual address had been sent to the secretary, and was read by Dr. E. D. Ferguson, of Rensselaer county.

Dr. N. A. Caldwell, of Montgomery county, gave a history of, and presented the specimen from, a case of complete occlusion of one ureter.

Dr. W. H. Robb, of Montgomery county, presented a case in which the sternal and clavicular ends of the clavicle could be voluntarily dislocated.

Dr. J. C. Hannon, of Rensselaer county, read a very interesting paper on "Lunatics, and their Victims," in which the doctor told of the serious injuries he had received during his care of a case of insanity, and gave valuable suggestions in relation to the care of such patients.

The papers were all freely and fully discussed.

The treasurer's report showed a balance of one dollar in the treasury, hence no assessment was made, nor contributions received.

On motion, Dr. N. A. Caldwell was appointed on the executive committee in place of Dr. E. T. Rulison, who had resigned.

The secretary was continued in office.

The place and time for the annual meeting in 1895 was left to the president and secretary.

On motion the branch adjourned.

ISAAC De ZOUCHE, *President.*
EZRA GRAVES, *Secretary.*

SECOND DISTRICT BRANCH.

The tenth annual meeting of the Second District Branch of the New York State Medical Association was held in Troy, N. Y., Thursday, May 24, 1894.

Thirty-five members were present.

The address of welcome was delivered by Dr. M. H. Burton.

Dr. M. H. Burton was elected to preside in place of the president, Dr. J. C. Benham, who was prevented from being present by sickness.

The following communication was received from the Fifth District Branch:

WHEREAS, a Fellow of this, Fifth District, branch proposes to attend the tenth annual meeting of the Second District Branch to meet in Troy, N. Y., May 24, 1894, be it

Resolved, That this branch send greeting, and an earnest wish for a successful meeting.

On motion of Dr. Ferguson the secretary was requested to send return greetings.

Dr. S. F. Rogers read a paper on "Etiology of Urticaria with Therapeutic Notes."

Dr. A. T. Van Vranken read a very interesting paper on "Uretero-Intestinal Fistula, as a Result of Abdominal Abscess, Not Due to Appendicitis."

Dr. Robert Selden read a paper on "Fracture of Skull," and reported a case.

Remarks were made by Dr. Hodgman.

A case of "Cancer of Penis, Operation and Recovery," was reported by Dr. Wm. Finder.

Dr. W. H. Hodgman gave some interesting remarks on the "Detection of Albumen in the Urine."

Dr. D. W. Houston's paper on "Extra-Uterine Pregnancy" was well illustrated and was discussed by Dr. Harvie.

A paper on "Some Considerations in Abdominal Surgery" was read Dr. John B. Harvie.

Dr. E. D. Ferguson gave a very interesting talk on "An Oxalate of Lime Calculus."

Dr. John W. S. Gouley, who was present, made some very interesting remarks on the subject.

Dr. Ferguson also made remarks on "Duodenal Ulcer," and reported a "Case of Cerebral Surgery."

The same officers were continued for another year.

There being no other business, the meeting adjourned.

The next meeting of the Second District Branch will be held at Catskill, on the last Thursday of June, 1895.

JOHN C. BENHAM, *President.*

Dr. JOSEPH E. BAYNES, *Secretary.*

THIRD DISTRICT BRANCH.

The tenth annual meeting of the Third District Branch was held at the Academy of Medicine in Syracuse, on May 17, 1894, and was called to order at 11 a. m., by the President, Dr. H. O. Jewett.

The attendance at the opening was quite small, but increased so that at the afternoon session about sixty were present, including members, delegates, and visitors.

The minutes of the last meeting were read in an abridged form, and then the secretary presented the report of the committee of arrangements, which provided for the meeting at the rooms of the Syracuse Academy of Medicine, which had been politely and willingly offered, but the secretary regrets that it did not occur to the branch to pass a resolution of thanks for the same.

The treasurer then reported, showing receipts of $15 and expenditures of $11.25, leaving a balance of $3.75.

The nominating committee was constituted of Drs. Higgins, Lester, Orton, Brooks, Carpenter, and Jacobson, and reported at a later hour, and their report was adopted as follows:

For members of the executive committee,—

J. G. Orton, M. D., Binghamton, Broome County.
W. R. Laird, M. D., Auburn, Cayuga County.
F. W. Ross, M. D., Elmira, Chemung County.
H. C. Lyman, M. D., Sherburne, Chenango County.
F. D. Reese, M. D., Cortland, Cortland County.
W. B. Morrow, M. D., Walton, Delaware County.
M. Cavana, M. D., Oneida, Madison County.
F. W. Sears, M. D., Syracuse, Onondaga County.
J. K. Leaning, M. D., Cooperstown, Otsego County.
B. T. Smelzer, M. D., Havana, Schuyler County.
F. G. Seaman, M. D., Seneca Falls, Seneca County.
W. L. Ayer, M. D., Owego, Tioga County.
John E. Beers, M. D., Danby, Tompkins County.

Binghamton was selected as the next place of meeting and Dr. J. H. Chittenden was selected as secretary.

Dr. Jacobson presented an extract from bill 140 relative to the prosecution of illegal practitioners, so correcting an error in the original bill. This petition was signed by all present.

Dr. H. O. Jewett was requested to prepare suitable resolutions upon the death of Dr. William Fitch, of Dryden, the resolutions to be read at the next annual meeting of the State Association.

The president's annual address was delivered by Dr. H. O. Jewett. The following is an abstract of his paper:

"Modern researches in medical science have extended in so many directions, embracing so wide a scope, and involving the elements of so many collateral sciences, that no ordinary human mind is sufficiently vigourous and comprehensive to master the system in its entirety. Hence, the now well recognised necessity of a division of labour, whereby each one may select a branch best adapted to his taste and talents, and by addressing to it his entire time and energies, if he have not mistaken his calling, he may acquire a degree of perfection unto which the general practitioner can never attain. I have the highest respect and a profound regard for learned, competent, conscientious specialists, for to them are we largely indebted for the rapid progress of medicine and surgery during the last quarter of a century. I do not, of course, include the corn-curer and 'clairvoyant,' whose 'examinations are free,' whose field of practice embraces many countries, and who parade 'astounding cures and remarkable successes,' together with puffing items in the advertising columns of the newspaper.

"In our large towns and cities, surgery is very properly being adopted more and more as a specialty, and the time is not far distant when the practice of medicine and of surgery will come to be regarded as two separate callings. But while it is not essential that every physician be an expert operator, it is necessary that the surgeon be something of a physician, acquainted with therapeutics, thoroughly posted in general and relative anatomy, and familiar not only with the teachings, but also the indications for operative interference; in other words, a good diagnostician. With these qualifications on the part of the practitioner, aided by the supreme advantage of anaesthetics, and fortified by the security offered by antiseptics, who shall estimate the future probabilities and possibilities of operative surgery?

"I confess I am not in sympathy with the purely experimental exploratory surgical operations solely for purposes of diagnosis. That surgery which is a success only in the operating room, and will not bear a place in the statistics of results, is neither a credit to the surgeon nor an honour to the craft. I am in favour of vivisection, but much prefer to see it practised on dogs and rabbits, than on God's noblest handiwork.

"It is necessary that every physician be familiar with the detail of the lying-in chamber. There is scarcely a more important or more embarrassing question than that which often arises as to the existence or non-existence of pregnancy, especially where important issues are involved, such as questions of virtue, parentage, legitimacy, etc. A young girl is afflicted with amenorrhoea, attended, perhaps, with ascites, or some other cause of abdominal enlargement; or a young lady is confined a few days prior to the expiration of the conventional nine months after marriage. The tongues of gossip, always ready for an uncharitable solution of a dubious question, are busy with whispered innuendoes that are worse than the stiletto. Then it is that the professional skill and knowledge

of the physician must interpose for the vindication of maligned virtue, or the preservation of domestic peace and harmony."

At this point, the meeting adjourned to the Vanderbilt hotel for dinner.

The afternoon session opened at 2 p. m. Dr. Higgins read an interesting paper on "Pre-Thyroid Cyst," describing a case recently under treatment, with operation. Drs. Jacobson and Higgins discussed the paper.

Dr. Leroy J. Brooks, of Norwich, then read an article, "Some Puerperal Complications." The paper was very interesting, and dwelt largely upon two cases then under care, both resulting in the formation of haemato-salpynx, and both ending in recovery, by means of spontaneous rupture of the bloody tumor into the tube, and so on through the uterus; clots and muco-purulent discharges being very free for the first few hours when pain and the symptoms which the patient had suffered, ceased. In one case there was quite normal accouchement and the symptoms, viz., chills, fever, pain, etc., developed gradually. Septic poisoning caused some anxiety in the other case, and the symptoms were more serious and continued for a longer time. Dr. Brooks covered the ground most thoroughly and drew the following conclusions: (1) The uterine orifice of the tube may become patent during the early part of the puerperal period. (2) A haemorrhage into the tube from rupture of the vessels of the mucous membrane may occur during puerperal period. (3) It is possible that the contraction of the uterus during the after pains may force blood clots into the tubes. (4) That haemato-salpynx should be recognised as a possible puerperal complication. (5) That the most frequent cause of haemato-salpynx is ectopic pregnancy. (6) That the next most frequent cause is that of atresia of the genital passage and flowing back of the menstrual flow. (7) That it may occur at any time from direct haemorrhage from the vessels of the tubal mucous membrane. (8.) That inflammations and congestive conditions, fevers, and puerperal haemorrhage are predisposing causes. (9) That spontaneous relief may occur from the haematoma emptying itself into the uterus, whether puerperal or non-puerperal. (10) That the accumulation may be absorbed without rupture. (11) That it may be cured by puncture through vagina or abdominal wall.

Dr. J. G. Orton, of Binghamton, read the next paper; title, "A Case of Epilepsy Apparently Cured by an Attack of Rheumatism Involving the Brain." "In presenting so very briefly the following case, I owe an apology to this association, but I desire simply to place it on record, perhaps only as an anomaly, perhaps as a hint to the neurologists:

"Some months since, I was called to an adjoining county to visit, in consultation, a gentleman whom I had long known as a confirmed epileptic. Hardly a week had elapsed for several years without his suffering from a recurrence of an attack of the characteristic paroxysms. His age was thirty-five; habits good; no syphilitic taint; no alcohol or opium habit; and no hereditary history.

"Complete loss of consciousness and the peculiar combination and

series of spasmodic movements always marked the attacks of the disease. His mind had become much impaired, seemingly from the long continuance and frequent repetition of these paroxysms. His memory especially had become very defective and he was entirely incapacitated for the transaction of any kind of business. He had been treated thoroughly with the bromides, but with apparently only temporary effect.

"About a week previous to my visit, this gentleman had been seized with an attack of acute articular rheumatism involving the knee-joint. The parts were much swollen, hot and painful. This was his first experience with the disease. His attending physician had treated him faithfully, and with a good measure of success, by the usual remedies, including the salicylate of soda, relieving the local and constitutional manifestations. But on the sixth day of the rheumatic invasion, a sudden metastisis of the disease to the brain seemed to take place.

"Intense headache, followed by wild delirium, similar to that of delirium tremens, immediately made its appearance, and continued uninterruptedly for forty-eight hours. Pulse, 100; temperature, 103°. There were no cardiac or lung complications. Pupils dilated. Alvine and urinary discharges, passing involuntarily. Skin dry, tongue coated with white fur.

"We advised that an ice-cap be placed on his head, and the rest of his body be bathed with tepid water. Internally, five grains of iodide of potassium, with ten grains of bromide of potassium, was given every three hours.

"The subsidence of the delirium was followed by a profound stupour, from which it was nearly impossible to arouse him in the least. This comatose condition gradually passed away in the course of three days, and no return of delirium followed.

"The rheumatism which had involved the knee-joint, and which had subsided in a great measure while the patient suffered from the cerebral complication, again appeared in the same joint, apparently in proportion as the delirium abated. Under the vigourous use of salicylate of soda, the rheumatic condition gradually passed away and the patient made a good recovery.

"To my great surprise, the epileptic paroxysms did not return, and although six months have elapsed since, he remains entirely free from the attacks, and appears mentally far better than he has for the last ten years. In fact, he has been able to attend to his business to a considerable extent. His memory seems as good as ever.

"I am not prepared to discuss the *modus operandi* of this new remedy for the cure of epilepsy; nor to present a theory as to any pathological or structural changes which may have taken place in the brain consequent upon its apparent involvement by the rheumatism. I prefer simply to report the case, and refer it to the consideration of our expert neurologists."

No discussion followed this highly interesting paper.

Dr. Jacobson read a paper with title, "A Case of Sarcoma of the

Scapula, with Removal by Excision of the Bone." The patient was presented before the society.

Next paper was by Dr. Didama; title, "Bile Sand." He first gave the chemical composition of bile, with the changes which may occur, and then described the manner of the formation of gall-stones. Reference was made to the size, varying from that of a hen's egg, down to stone sand. The usual symptoms were related, also the symptoms which accompany the expulsion of the bile sand, viz.—severe pain below the xiphoid cartilage at the junction of the common duct and the duodenum, which was of comparatively short duration, seldom causing jaundice. These attacks recur and are mistaken for gastralgia, often continuing or recurring for years. When the attacks become more frequent and tenderness is found over the pyloric region, it causes one to suspect cancer or ulcer. The diagnosis, after a complete history, will dispel this idea.

The treatment suggested was the same as is usually employed. Hypodermatic injections for the pain, together with hot applications and whiffs of chloroform. The acid condition of the system should be rectified by use of the salts of sodium, singly or in combination, which, if given in large doses, loosen the bowels, and increase the amount of bile, rendering it thinner and enabling it to hold the cholesterine in solution.

The diet should be regulated; soft water as a beverage; but little starch and sugar should be taken into the system; meat, never in excess. Milk and the vegetables of the season should constitute a large part of the diet. Out-of-door life and vigourous exercise should be enjoined upon patients.

Dr. Van de Warker presented the last paper. His subject was, "Diagnosis and Treatment of Tuberculosis of the Peritonaeum." The paper was highly interesting, and covered the ground in a scientific manner. Some discussion followed by Drs. Allen and Brooks, who did not entirely concur with the views of the reader concerning the usual course of the inception of the germ. The paper was to be published at once in some of our journals, thus preventing the secretary from securing notes from the paper.

A motion to adjourn was then moved and carried.

H. O. JEWETT, *President.*
F. H. STEPHENSON, *Secretary.*

FOURTH DISTRICT BRANCH.

The tenth annual meeting of the Fourth District Branch was held at the Iroquois hotel, Buffalo, Tuesday, May 9, 1894.

Dr. Strong, president, in the chair.

In the absence of Secretary Thornton, Drs. Stockton and Goler were elected secretaries *pro tem.*

On motion, the following nominating committee was appointed to select an executive committee for the ensuing year: Drs. Ames, Stockton, Jackson, Huggins, Ellinwood, Taylor.

President Strong then delivered his address, "Some Achievements of the Association during its First Decade." In closing his address Dr. Strong recommended that a custom adopted by the parent Association of having some principal subject for discussion be adopted by the Fourth District Branch at its next meeting.

Dr. Cronyn moved that influenza be made the subject for 1895, and that the chair appoint a committee to arrange for a series of papers on that subject.

Dr. Goler was appointed as such committee.

The first paper, "Clinical Memoranda on Heart Disease," was read by Dr. Stockton. The paper was discussed by Drs. Green, Jones, Rochester, Ames, and Pryor (invited guest).

Dr. A. A. Hubbell read "Phlyctenular Inflammations of the Eye."

Dr. Howe (invited guest) discussed the paper.

The Association then adjourned until 2:30.

The meeting was called to order by the president.

Dr. Stockton reported for the nominating committee the following executive committee:

Allegany County,	Dr. J. A. Stephenson.
Cattaraugus County,	Dr. S. J. Mudge.
Chautauqua County,	Dr. R. T. Rolph.
Erie County,	Dr. A. H. Briggs.
Genesee County,	Dr. M. W. Townsend.
Livingston County,	Dr. R. J. Menzie.
Monroe County,	Dr. G. W. Goler.
Niagara County,	Dr. W. Q. Huggins.
Ontario County,	Dr. H. W. Nichols.
Orleans County,	Dr. H. C. Tompkins.
Steuben County,	Dr. C. G. Hubbard.
Wayne County,	Dr. Darwin Colvin.
Wyoming County,	Dr. George W. Palmer.
Yates County,	Dr. Wm. Oliver.

On motion, the report was adopted.

"Tic Douloureux, with Reports of Cases and Two Successful Neurectomies," was the subject of a paper by Dr. Baker.

Discussed by Dr. Park.

Dr. Park gave an informal talk upon the "Preparation of a Patient for Operation." He prefaced his remarks by paying a tribute to the memory of the three great European surgeons, Professor Ticher, L'Abbé, and Bilroth.

Dr. Benedict (invited guest) demonstrated a method of treatment for gastric diseases by means of the menthol spray introduced through a stomach tube.

The secretary announced an invitation to attend its meetings from the section of medicine of the Buffalo Academy of Medicine.

Dr. Hartwig (invited guest) addressed the Association on the extension of esteoplastic, the operation for the relief of deformities, contracted pelvis, and to elongate legs.

Dr. Krause introduced a number of lantern slides demonstrating many of the principal lesions of the brain and spinal cord.

A report from the treasurer was then read, in which it was stated that funds were sufficient and recommending that no assessment be levied.

The meeting then adjourned.

T. D. STRONG, *President.*
W. H. THORNTON *Secretary.*

FIFTH DISTRICT BRANCH.

The tenth annual meeting of the branch was held at 315 Washington street, Brooklyn, on Tuesday, May 22, 1894.

The morning session was called to order by the president, Dr. J. D. Rushmore, at 11: 10 a. m.

The secretary read the minutes of the last meeting which were approved as read. The report of the committee of arrangements was read and accepted.

The president announced that he had already appointed Dr. M. C. Conner, and would now appoint in addition, to comply with the by-laws, Dr. J. R. Vanderveer to act with the secretary as registration committee.

As the president's address was next in order, Dr. E. R. Squibb was called to the chair. After a few general remarks in his address in relation to the welfare and standing of the branch, the president took up the theme of his remarks "On the Prevention of the Disagreeable and Dangerous Symptoms produced by Ether as a general Anaesthetic."

The subject was discussed by Drs. Leighton, E. R. Squibb, Raynor, Van Hoevenberg, Bierwith, Barnes, North, and the author.

The president then resumed the chair, and the business was continued.

There was no report of delegates this year.

The secretary next read the minutes of the executive committee for last year, as required by the by-laws. and then read the report for this year, as follows:

Your executive committee begs leave to report that there has been only one meeting during the past year, and that, the one held this morning. The meeting called for immediately after last year's annual, to elect a secretary for the then ensuing year, was not held for lack of a quorum, so the secretary held over for the year just passed.

The committee regrets to report that it has lost one of its members by death since the last meeting—Dr. Wm. Govan of Rockland county—and a minute was recorded as a meagre but earnest tribute to his memory.

As will be seen from the treasurer's report, the financial condition of the branch is excellent, notwithstanding the great depression of the past year. The investments are of such security that the interest accruing has been paid promptly with but one exception, and this one only involves the passing of one interest date to the amount of $6. The receipts for the year were from assessments $34, by interest $63.64, making a total of $97.64. The general expenses were $77.50. The

increase in the permanent fund for the year was $40, making a total now in the fund drawing interest of $1,180.

Several Fellows having appealed to the executive committee to learn the proportion of Fellows who have joined the permanent fund by voluntarily paying down $5 and thus being exempt from all future assessments, the committee takes pleasure in making the following statement: Not counting the twenty-one Fellows of last year, who have just become assessable, and therefore have not yet had an opportunity to choose, not counting these twenty-one, 72 per cent. of the total active Fellows since the beginning of the plan in 1889 have availed themselves of the privileges of the fund. This is very gratifying, and furnishes almost conclusive evidence that practically all would join in its benefits if they would only carefully consider, not only the saving in expense and trouble to themselves by making one deposit, but the saving in expense incurred by the branch itself in presenting assessment bills at stated intervals.

The treasurer's accounts were duly audited and approved.

The committee have fixed the fourth Tuesday in May, 1895, for the next Branch meeting, which will be the eleventh annual.

The five invited guests and the nine delegates from the Kings County Medical Association are extended a cordial welcome and full privileges of the floor.

There have been only three resignations of Fellows of this district during the year.

The eighteen Fellows who have recently joined the association are according to custom exempted from assessment for the ensuing year.

Respectfully submitted,

E. H. SQUIBB, *Secretary.*

On motion the report was adopted which the secretary reminded the meeting included the welcome to guests and delegates, and also the approval of the treasurer's accounts as audited by the committee.

The treasurer then read his annual statement which called for no action on the part of the branch at this time, as it had been previously approved.

Under the head of "Report of Special Committees," the secretary as committee on necrology reported as follows:

The secretary regrets to have to announce officially that since the last annual meeting of this branch, there have been five deaths among the Fellows of this district.

Three Founders:

Dr. A. L. Carroll.
Dr. W. T. White.
Dr. Wm. Govan.

One Original Fellow: Dr. John Young, and quite recently, Dr. M. K. Hogan.

The biographical sketches were here called for.

At the request of the writers of each, the secretary read the following:

On Dr. W. T. White by John Shrady, M. D.
On Dr. John Young by C. M. Kittredge, M. D.
On Dr. Wm. Govan by I. D. LeRoy, M. D.
On Dr. M. K. Hogan by Wm. O'Meagher, M. D.
On Dr. A. L. Carroll by E. S. F. Arnold, M. D.
On Dr. A. L. Carroll by J. W. S. Gouley, M. D.
On Dr. A. L. Carroll by Anna Lukens, M. D.

As the remaining readers on the programme were not present with their sketches, the secretary was authorized to receive such sketches when presented, to be immediately handed over to the committee on necrology of the state association for publication.

There was no unfinished business.

New business: the secretary read the meeting notices of the Second and Fourth District Branches recently received.

Dr. E. H. Squibb then offered the following resolutions:

To the American Medical Association, San Francisco, Cal:

WHEREAS, It is known that your committee on the revision of the constitution and by-laws has published a majority and a minority report to be presented for action at your approaching annual meeting, and that a general expression of judgment upon these reports is desirable, therefore be it

Resolved, That this branch association opposes the adoption of the majority report because it proposes to surrender some of the organic principles of The American Medical Association, and because it would be hurtful in effect:—and it opposes the minority report because it is unnecessary.

Resolved, That this branch of the profession, as represented in The American Medical Association, through or by The New York State Medical Association, does most earnestly and anxiously deprecate this continuous agitation of this code question, and begs that it may be suppressed before it does further damage to the best interests of the National Association.

Resolved, That a copy of this action be forwarded by the president of this association, through the president of the state association to the president of the national association.

J. D. RUSHMORE, *President.*
E. H. SQUIBB, *Secretary.*

In seconding these resolutions, Dr. S. B. W. McLeod spoke at some length, strongly endorsing the sentiments, and urging their adoption. On motion they were carried unanimously.

After some preliminary discussion as to how best to secure the signature of the president of the state association in which telegraphing was suggested, it was finally decided that one of our Fellows should act as special messenger to the secretary of the state association, who in turn would see that the president came into possession of them.

The scientific business was then taken up by Dr. T. J. McGillicuddy reading his paper on "The Dietetic Treatment of Consumption." As the morning session had already been prolonged over the allotted time, it was moved and carried that the discussion be postponed until immediately after lunch.

The business of choosing the nominating committee was next taken up by the secretary calling off the counties of the district in alphabetical order, and the Fellows present from each county nominating one member to represent his county on such.

Nominating Committee:

Dutchess County,	Dr. J. G. Porteous.
Kings County,	Dr. J. D. Sullivan.
New York County,	Dr. A. D. Ruggles.
Orange County,	Dr. M. C. Connor.
Putnam County,	None present.
Queens County,	None present.
Richmond County,	None present.
Rockland County,	None present.
Suffolk County,	Dr. Walter Lindsay.
Sullivan County,	None present.
Ulster County,	Dr. H. Van Hoevenberg.
Westchester County,	None present.

This committee was then requested to meet immediately during the intermission.

In adjourning the morning session at 1:30 p. m., for lunch, the president extended a cordial invitation to all present, whether they be invited guests and delegates or not, to join us in the adjoining rooms.

The afternoon session was called to order by the president at 2: 30 p. m., and the scientific business was resumed by announcing that the postponed discussion on Dr. McGillicuddy's paper was now in order.

Discussed by Dr. J. Blake White only.

Dr. Edward Sanders next read his paper on "The Treatment of Chronic Oöphoritis by Electricity," after which he exhibited his modified electrode and his home-made, but specially effective, pads.

Dr. L. G. Baldwin was called for to open the discussion, but was not present. It was discussed by Drs. F. H. Wiggin, J. Blake White, T. J. McGillicuddy, the president, and closed by the author.

Dr. F. H. Wiggin then read his report of "A Case of Chronic Peritonitis with Intestinal Fistula. Celiotomy. Enterorrhaphy. Recovery."[1]

Discussed by Drs. E. Sanders and J. B. White.

The president next announced that the general discussion of "Vaccination" was now in order, and called upon Dr. F. A. Jewett to open the discussion, but for the better sequence in opening, Dr. H. H. Morton was asked to lead. Dr. Morton read his very interesting remarks, and Dr. Jewett followed verbally. Dr. S. E. Jelliffe having been called off on duty, Dr. Jewett read his statistics in relation to work in the public schools of Brooklyn during the recent epidemic. The subject was further discussed by Drs. J. Blake White and J. H. Raymond (a guest). Upon Dr. Raymond mentioning the proposed good work both as to vac-

[1] Published in N. Y. Med. Record, vol. xlvi, p. 168.

cination, and other hygienic purposes now being attempted by the board of education, and that $6,000 had been placed in the budget for that purpose, Dr. F. A. Jewett offered the following resolution:

That a committee of two be appointed to wait upon the Brooklyn board of estimate, at the proper time, in order to urge the expediency and ultimate economy of the proposed appropriation in the budget to be used by the board of education for hygienic purposes.

And, on motion, the following two Fellows of the New York State Medical Association were appointed such committee:

Dr. J. D. Rushmore, president N. Y. State Medical Association, Fifth District Branch.

Dr. T. M. Rochester, president Kings County Medical Association.

This resolution and the whole subject were still further discussed by Drs. F. C. Raynor, N. L. North, the president, N. W. Leighton, J. W. S. Gouley, J. B. White, and E. R. Squibb. The resolution and motion were then put and carried unanimously.

As a matter of courtesy and good feeling to our sister branch, the following resolution was offered and unanimously carried:

WHEREAS, A Fellow of this Fifth District Branch proposes to attend the tenth annual meeting of the Second District Branch to meet in Troy on May 24, 1894, be it

Resolved, That this branch send greeting and an earnest wish for a successful meeting.

[Signed] J. D. RUSHMORE, *President.*
E. H. SQUIBB, *Secretary.*

The nominating committee's report was then read nominating the following Fellows as an executive committee for the ensuing year, to represent:

Dutchess County,	Dr. Edwin Barnes.
Kings County,	Dr. Wm. McCollom.
New York County,	Dr. S. B. W. McLeod.
Orange County,	Dr. M. C. Conner.
Putnam County,	Dr. G. W. Murdock.
Queens County,	Dr. E. G. Rave.
Richmond County,	Dr. H. C. Johnston.
Rockland County,	(Vacant).
Suffolk County,	Dr. Walter Lindsay.
Sullivan County,	Dr. C. W. Piper.
Ulster County,	Dr. H. Van Hoevenberg.
Westchester County,	Dr. H. E. Schmid.

On motion, the report was accepted and approved, and the committee discharged.

The president then called a meeting of this new executive committee for immediately after adjournment to elect a secretary for the ensuing year, but as a quorum was lacking, the meeting was not held.

The register showed thirty-seven Fellows, five delegates, and five guests present.

Adjourned at 5:10 p. m. to meet one year from this date.

J. D. RUSHMORE, *President.*
E. H. SQUIBB, *Secretary.*

EXECUTIVE COMMITTEE.

A called meeting of the executive committee was held at 315 Washington street, Brooklyn, on Tuesday, May 22, 1894. The meeting was called to order by the president, Dr. J. D. Rushmore, at 10:20 a. m.

Present:

Dr. I. D. LeRoy.
Dr. M. C. Conner.
Dr. Walter Lindsay.
Dr. J. D. Rushmore.
Dr. E. H. Squibb.

Five members present, eight absent (one deceased).

The secretary read the minutes of the last meeting, which were approved as read.

The secretary announced that the members were aware that the committee of arrangements was elected by circular vote this year. The vote was unanimous for the committee now serving.

The following report of the committee of arrangements was then read and approved:

REPORT OF THE COMMITTEE OF ARRANGEMENTS FOR THE ANNUAL MEETING, 1894.

Your committee herewith report that they thought it unnecessary to make any change whatever in the arrangements adopted and satisfactorily carried out last year, and in repeating the same this year, trust they may be fully as successful.

The hour of 11 a. m. was set for opening the morning session.

Respectfully submitted:

R. M. WYCKOFF, *Chairman.*
J. C. BIERWIRTH.
N. W. LEIGHTON.
T. M. LLOYD.
WILLIAM McCOLLOM.
J. D. RUSHMORE, *President,* } *Ex officio.*
E. H. SQUIBB, *Secretary,* }

March 31, 1894.

The president next appointed Dr. M. C. Conner to act with the secretary as registration committee, together with one other Fellow from the general meeting later.

The secretary reported the death of five Fellows of this district for the year:

Dr. A. L. Carroll,
Dr. W. T. White,
Dr. Wm. Govan,
Dr. John Young,
Dr. M. K. Hogan,

and offered the following on the death of Dr. Govan, who was a member of this committee:

Mr. Chairman:—It is with deep regret that we have to record the death of one of our fellow members, who has represented Rockland county on our committee since the organisation of the association in 1884—Dr. William Govan, of Stony Point. He was one of the founders of this association, untiring in his attendance at all meetings, and a staunch supporter of its principles. Out of the total number of meetings of the state and branch associations, together since organisation, amounting to twenty-seven in all, he has only been absent from six, and has always shown an interest in their welfare equal to, if not greater than, the average member. He was familiar with all the business of this branch, and took active part in all the steps undertaken to further its interests. We therefore miss his presence and counsel more than any member who has served on this committee, and fear that the branch will find it difficult to fill his place with a more earnest Fellow.

On motion the remarks were ordered spread on the minutes.

The treasurer then read off his receipts and expenses in detail and presented his annual statement as follows:

TREASURER'S ANNUAL STATEMENT, MAY 23, 1893, TO MAY 21, 1894,

Fifth District Branch, New York State Medical Association, with E. H. Squibb, Treasurer.

To balance cash as per statement May 23, 1893	$132.66	
Assessments collected	34.00	
Interest	63.64	
		$230.30
Rent of meeting rooms for ninth annual meeting	$10.00	
Catering for ninth annual meeting	50.00	
Postage	13.00	
Printing	4.50	
Balance on hand	152.80	
		$230.30

PERMANENT FUND ACCOUNT.

Total amount of fund as per statement May 23, 1893	$1,140.00	
Contributions to fund to date	40.00	
		$1,180.00
Investment in railroad bond, 5 per cent. interest .	$830.00	
Balance on hand at interest	350.00	
		$1,180.00

The president then appointed Dr. Lindsay to audit the accounts, and the cash book, vouchers, and annual statement were surrendered to him for examination.

It was next moved and carried that the next meeting of the branch should be the eleventh annual, to be held in Brooklyn, on the 4th Tuesday in May, 1895, as provided by the by-laws.

It was here stated that as a quorum was not present at the duly called meeting to elect a secretary for the year the present secretary held over.

The secretary announced that the following invited guests were expected to be present:

Dr. L. Grant Baldwin, Brooklyn.
Dr. Smith Ely Jelliffe, "
Dr. Wm. E. Griffiths, "
Dr. Jonathan Wright, "
Dr. H. C. Riggs, "

Also the following delegates from the Kings County Medical Association:

Dr. A. C. Brush.
Dr. H. R. Maine.
Dr. F. S. Milbury.
Dr. H. H. Morton.
Dr. H. M. Smith.
Dr. L. J. Paris.
Dr. A. Wieber.
Dr. F. J. J. Wood.
Dr. Jerome Walker.

On motion, a cordial welcome and full privileges of the floor were extended to these gentlemen.

The secretary here mentioned that owing to Dr. E. Potts's failure to write a biographical sketch of the late J. H. Hunt, M. D., of Port Jervis, as stated on last year's meeting notices, Dr. M. C. Conner had kindly undertaken to furnish such a sketch which will now be found in the Transactions.

It was moved and carried that the secretary be requested to look after the publication of the papers offered, as heretofore.

The secretary reported that there were only three resignations during the year,

Dr. T. Dunham, New York City.
Dr. Albert Shunk, "
Dr. A. N. Bell, Brooklyn.

On motion, the treasurer was directed to send out the annual assessment bills as heretofore for $1 to all those Fellows who have not joined the permanent fund, appending the customary slips inviting such to join *voluntarily* by depositing $5, and thus being exempt from all future assessments. Those in arrears for at least $6 not to be accorded such privilege until arrears be paid.

Eighteen Fellows who had recently joined the Association were exempted from assessment for the ensuing year, according to custom.

The report of this meeting proposed to be submitted to the general meeting was then read and approved.

Dr. Lindsay here reported that he had found the treasurer's accounts in accord and in good order.

Adjourned at 10: 50 a. m.

E. H. SQUIBB, *Secretary.*

NEW YORK COUNTY MEDICAL ASSOCIATION.

ANNUAL REPORT.

It is to be hoped that each annual report as presented will not only preserve the standard of its predecessor, but also show improvement and growth. As science is progressive so should be the condition of an association designed for its promotion. As numbers are an indication of professional approval, so should an increased membership be a symptom of a more general approbation. Trusting that these hopes may be realised, this report is respectfully submitted for the consideration of the state association.

Public Health.—At the meeting, October 16, 1893, Dr. E. G. Janeway presented the subject of "Dangers to the Public Health of New York from Over-crowded Population." This was discussed by Drs. Chas. A. Leale, J. R. MacGregor, J. Lewis Smith, and L. Landes. The discussion was closed by Dr. Janeway.

Diseases of the Eye.—At the same meeting a paper was read by Dr. Frank Van Fleet on the "Necessity of Perfect Vision in the Education of the Young." The discussion was conducted by Drs. Hepburn, G. H. Cocks, and W. H. Bates, and closed by Dr. Van Fleet, the reader of the paper. On April 16, 1894, Dr. J. H. Claiborne presented a paper on "Quinine Amaurosis," which was discussed by Drs. Hepburn and Van Fleet, and others, and closed by the author of the paper.

Diseases of Women.—On November 20, a paper was read by Dr. Augustine H. Goelet on the "Treatment of Uterine Fibroids. This paper was discussed by Drs. G. T. Harrison, N. G. Bozeman, J. M. Bleyn, and Brandon Reed, of Atlantic City, N. J. Discussion closed by Dr. Goelet.

December 18, 1893. The paper of the evening was written by Dr. T. Gaillard Thomas on the "Chief Factors in the Production of the Diseases Peculiar to Women." This paper was read by Dr. Carnult and discussed by Drs. G. T. Harrison, H. J. Boldt, A. H. Goelet, E. E. Tull, S. Brothers, F. M. Nye, and R. A. Murray. At the June meeting Dr. Edward Sanders read his paper on the "After Treatment of Four Cases of Salpingo Oöphorectomy by Electricity: a Text and a Commentary." Discussion by Drs. G. T. Harrison, J. B. White, and H. J. Boldt, and closed by Dr. Sanders.

Practice of Medicine.—At the meeting, February 19, 1894, Dr. J. Lewis Smith read a paper on "Statistics of the Use of Hydrogen Dioxide and Papoid in Pseudo-Membranous Inflammation." Discussion by Drs. J. B. White, F. W. Lester, R. Hunter, and Ferd. C. Valentine, and closed by Dr. Smith.

At the meeting March 16, 1894, Dr. J. B. White presented a paper on "The Tubercular Diathesis Controlled by Gold and Manganese in Combination." Discussion by Drs. Lester, O. A. White, and the president, and closed by the author.

On May 21, 1894, Dr. J. G. Coyle read his paper on "Membranous Enteritis with Report of Case." Discussion by Drs. Gessner, Harrison, and the president, and closed by Dr. Coyle.

Orthopaedics.—At the meeting April 16, 1894, a paper was read by Dr. J. W. Hawkes on "The Paper Jacket: Its History and Applications." Discussion by Drs. A. B. Judson, E. Van Donhoff, and T. H. Newland, and closed by Dr. Hawkes.

On November 20, 1894, Dr. Samuel E. Milliken's paper was on "Application of Plaster-of-Paris Jackets in Pott's Disease of Spine, Illustrating Immobility *v.* Extension." Discussion by Dr. R. H. Sayre by invitation, and Drs. Judson and Van Donhoff; closed by Dr. Milliken.

Military Surgery.—On May 21, 1894, Dr. J. D. Bryant, surgeon-general of the state, presented the subject of "The Medical Department of the National Guard: Its Status in Two Decades." Discussion by Dr. N. H. Henry and others.

A brief epitome of this paper was published in the *Medico-Legal* and other journals. Dr. Bryant showed that great improvements had been made in the medical department of the National Guard, and that now the various regiments had competent surgeons who attended as well to their surgical as their military duties. The value of the guard to the safety and security of the state should be more highly appreciated, and more mention be made of its medical officers. In this belief Dr. Bryant was asked to address the association, and by his kind consent the subject was prominently brought before the medical profession.

In addition to these formal papers and discussions on scientific subjects, at the meeting in March, 1894, Dr. C. B. Meding read a paper on "Specialties and Specialisms," descriptive of their usefulness in medicine and their just limitations. This was discussed by Dr. E. Van Donhoff and R. H. Anderson and closed by the author.

On another occasion, February 19, 1894, Dr. J. J. E. Maher exhibited a mechanical demonstration of a new axis traction forceps, or rather, as he described it, a perfect obstetrical forceps, and Dr. A. H. Goelet described with the aid of a diagram the technique of a new operation for ligature of the uterine arteries per vaginam.

Dr. Milliken showed three patients on whom he had performed the operation for radical cure of varicocele, and Dr. R. Abrahams a patient, being a most interesting case of myxoedema, and Dr. Hawkes a patient whom he had trephined for persistent frontal headache with a successful result.

Pathological specimens have been presented at several meetings, all of more than ordinary interest, by Drs. Adolphe Reisch, A. B. Tucker, and C. I. Proben.

At the annual meeting, January, 1894, the following officers were chosen:

President—Dr. S. B. W. MacLeod.
Vice-President—Dr. A. D. Ruggles.
Recording Secretary—Dr. P. Brynberg Porter.
Corresponding Secretary—Dr. W. W. Van Arsdale.
Treasurer—Dr. John H. Hinton.
Member of Executive Committee—Dr. J. Blake White.

The Annual Register of Members and Manual of Information has been published and quickly distributed. The custom of partaking of a collation at the close of each monthly meeting and making that of June an occasion of special festivity has been found to be a profitable addition to our exercises. By affording time for social intercourse which is not supplied in the meetings for scientific or business purposes, the members have an opportunity of greater acquaintance and useful conversation.

The association continues to increase in numbers, and the attendance at the meetings is large. At the close of June, 1894, the membership was one thousand and five (1,005).

When the work of the living is recorded we should not be unmindful to preserve the memory of the dead. Drs. Kent, Carroll, Oscar G. Harrison, Coan, G. W. Weeks, Degner, Hogan, Sinnett, S. T. Hubbard, and J. E. Ward have all during the past year changed their sphere from this to the other world. They have left a good name in the places they respectively occupied, and with melancholy pleasure their memory is hereby honored in the closing of this report.

S. B. W. MacLEOD, *President.*

KINGS COUNTY MEDICAL ASSOCIATION.

ANNUAL REPORT BY THE SECRETARY.

The Kings County Medical Association has held nine regular meetings in the year 1894, at which have been read thirteen papers upon medical and scientific subjects.

In membership and in interest the association is maintaining its traditions.

During this year the association has been obliged to take action upon the death of one of its oldest members, Dr. B. F. Fessenden. At the request of the association, his friend of many years, Dr. G. A. Ostrander, prepared an obituary sketch which was read before the association at its November meeting. It was then ordered that it be spread upon the minutes of the association.

The officers of the association for the year 1895 will be:

President—Dr. J. C. Bierwirth.
Vice-President—Dr. N. W. Leighton.
Recording Secretary—Dr. F. C. Raynor.
Corresponding Secretary—Dr. H. C. Riggs.
Member of Executive Committee—Dr. T. M. Rochester.

PROCEEDINGS.

ELEVENTH ANNUAL MEETING

OF THE

NEW YORK STATE MEDICAL ASSOCIATION,

HELD AT THE MOTT MEMORIAL HALL, 64 MADISON AVENUE, NEW YORK CITY, OCT. 9, 10, AND 11, 1894.

FIRST DAY, OCTOBER 9.

MORNING SESSION.

The meeting was called to order by the PRESIDENT, Dr. THOMAS D. STRONG, of Chautauqua county, at 10 a. m.

The report of the Committee on Arrangements was presented by the Chairman, Dr. CHARLES ELLERY DENISON, of New York county, and upon motion, the report was accepted and adopted.

The annual report of the Council was then read by the SECRETARY.

Upon motion, the report of the Council was accepted and adopted.

The following committee on TREASURER'S accounts was appointed by the PRESIDENT:

Dr. DARWIN COLVIN.
Dr. DOUGLAS AYRES.
Dr. B. S. W. MACLEOD.

The reports of the various branch associations were then presented by title, after which the programme of papers was followed.

AFTERNOON SESSION.

The meeting was called to order by the PRESIDENT, at 2 p. m.

The SECRETARY announced the appointment of the following Nominating Committee:

First District, W. H. Robb and Douglas Ayres.
Second District, T. C. Hannan and M. J. Phalen.
Third District, T. G. Packer and L. J. Brooks.
Fourth District, D. Colvin and Z. J. Lusk.
Fifth District, J. G. Truax and Ellery Denison.
At large, E. D. Ferguson.

The scientific work then occupied the time until the meeting adjourned at 5:15 p. m.

Night Session.

The meeting was called to order by the President at 8 p. m., and the entire session was devoted to scientific business.

The meeting adjourned at 10:30 p. m.

Second Day, October 10.

Morning Session.

The meeting was called to order by the President at 10 a. m.

Dr. S. S. Purple, of New York: "Since our last annual meeting a distinguished member of the profession has died—Dr. Samuel T. Hubbard, of New York county. He was a Founder of this Association and a member of the Central Committee that organised the Association. I move that a committee be appointed to draw up appropriate resolutions, and present them to the Association." Seconded. Carried.

The following committee was appointed on these resolutions:

Dr. S. S. Purple.
Dr. S. B. W. McLeod.
Dr. A. D. Ruggles.

"A Specimen of Hermaphroditism" was presented by Farquhar Ferguson, M. D., of New York county.

Dr. Ferguson said that the individual from which the specimens were taken had been a cook in the family of a physician. The hair of the head was that of a woman, but the face was masculine, and there was a well defined beard on the upper lip and lower part of the face. The mammary glands and the pelvic were of the male type. The external genitals resembled those of the female, but there was a well defined rudimentary penis, with foreskin and glans, and with a dimple at the summit of the glans. The vagina terminated one and a half inches short of its normal location. The Fallopian tubes and ovaries were normal. The cause of death was some brain affection. The only other interesting feature of this autopsy was the presence of two exceedingly large suprarenal capsules. Their minute structure had not been yet carefully examined.

The programme of scientific business was then taken up.

The meeting adjourned at 11:45 a. m.

Afternoon Session.

The meeting was called to order by the President at 2 p. m., and was entirely devoted to the reading and discussion of papers. The meeting adjourned at 2:30 p. m.

Night Session.

The meeting was called to order by the President at 8 p. m.

The first portion of the session was devoted to scientific business, after which the members partook of a collation.

Third Day, October 11.

Morning Session.

The meeting was called to order by the President at 10 a. m.

The Secretary presented the following amendment to the Constitution and By-Laws, which was laid over under the rule:

That the amendment to the Constitution recorded on pages 776 and 777 of Vol. IX of the Transactions be amended so as to remove all the words after the word "shall" in the second line on page 777 of Vol. IX, to and including all the third line.

The report of the Nominating Committee was then presented, and was as follows:

President—Austin Flint.
Vice-President, First District—D. W. Klock.
Member of Council, First District—A. P. Dodge.
Vice-President, Second District—W. H. Hodgman.
Member of Council, Second District—A. J. Van Vranken.
Vice-President, Third District—F. W. Putnam.
Member of Council, Third District—L. J. Brooks.
Vice-President, Fourth District—M. W. Townsend.
Member of Council, Fourth District—Charles G. Stockton.
Member of Council, Fifth District—J. D. Bryant.

[Signed] D. COLVIN, *Chairman.*
J. G. TRUAX, *Secretary.*

On motion, the Secretary deposited this report as the vote of the Association for the officers presented in this report.

The following report was then presented:

October 9, 1894.

To New York State Medical Association:

MR. PRESIDENT: Agreeable to the appointment I have attended the meetings of the Rhode Island Medical Society during the last year, as the delegate from the New York State Medical Association, and tendered greetings and sympathy to that body. At the quarterly meeting held December 7, 1893, in Providence, on invitation I read a paper, which the society have published in their Transactions. The Rhode Island Medical Society adhere to the old code of the American Medical Association, and have good scientific papers read at their quarterly meetings.

Your delegate was received kindly with the usual ceremonies of introduction, and called to address the meeting. All of which is

Respectfully submitted:

ROBERT NEWMAN, M. D.

The committee appointed to report proper resolutions on the death of DR. SAMUEL T. HUBBARD, presented the following:

WHEREAS, It has pleased an all-wise Providence to remove from us by death since our last annual meeting, our esteemed friend and co-worker, SAMUEL T. HUBBARD, M. D., who died at his residence in the state of New York, on the 1st day of June, 1894.

Resolved, that by the death of DR. SAMUEL T. HUBBARD, who was a member of the Central Council which formulated—and a Founder of—this Society—the New York State Medical Association has lost an early and influential member, one whose constant and unremitting labours have done much to extend its influence and render prominent its success;

Resolved, That this Association recognises in his genial manner, sound advice, and efficient labours in its behalf, the elements of the true friend and Christian gentleman;

Resolved, That we deeply deplore his death, and desire to extend to his bereaved family our sincere condolence in this their great bereavement;

Resolved, That a copy of the foregoing preamble and resolutions be transmitted by the SECRETARY to the family of the deceased;

Resolved, That a copy also be entered upon the minutes of the Association, and that the same be published in the forthcoming volume of Transactions.

All of which is respectfully submitted.

[Signed] SAMUEL S. PURPLE, M. D., *Chairman.*
S. B. W. MCLEOD, M. D.
A. D. RUGGLES, M. D.

The report was unanimously accepted and adopted.

The Committee on TREASURER'S Accounts, through the Chairman, DR. COLVIN, reported that they had examined the same and found them correct.

On motion the report was accepted.

The meeting adjourned at 12:15 p. m.

Third Day, October 11.

Afternoon Session.

The meeting was called to order at 1:45 p. m.

At the close of the scientific portion of this session the retiring President requested the newly elected President, Dr. Austin Flint, to take the chair.

Dr. Austin Flint then said: I am unprepared to express myself in fitting terms in acknowledgment of the honour that has been conferred upon me, as I do not deserve this honour. This mark of confidence is, to say the least, peculiarly touching to me, and all that I can do is to promise my best efforts, and to express the hope that the officers of the Association who have done so much to bring it to a high scientific position, will grant me their aid; and that with that aid I will be able to say when the next session is over that it has not been so very much less efficient than those which have preceded it. I came entirely unprepared to make any acknowledgment, and I hope you will excuse me for any lack of readiness of speech on this occasion.

At 4:30 p. m., the Association was declared adjourned *sine die*.

E. D. FERGUSON, *Secretary*.

ANNUAL REPORT OF THE COUNCIL

AND

MINUTES OF THE SESSIONS OF THE COUNCIL,

FOR THE YEAR 1894.

The Council met in its eleventh annual session at the Mott Memorial Library, on Monday evening, October 8, 1894.

The session opened at 8 p. m.

Present: Dr. T. D. Strong, Chairman, and Drs. Bryant, Denison, Dodge, Ferguson, Gouley, Truax.

The Secretary then reported the following list of applicants who had been appointed to Fellowship since the last meeting of the Council by circular vote, viz.,—

L. G. Barton, Thomas C. Church, M. D. Dickinson, Stuart Eldridge, Thomas Burnham Enders, D. Hunter McAlpin, Edward S. Farrington.

The following applicants were then appointed Fellows, viz.,—

Parker Syms, George W. Miles, W. F. Drake, Ransom J. Parker, Emmett D. Page, Mark N. Brooks, C. W. Clendenan, Cordelia A. Greene, George L. Meyer, Henry B. Burton, M. B. Hutton, Frank S. Milbury, J. J. Montgomery, E. W. Morehouse, Frank D. Reese, William Hallock Park, J. J. E. Maher, Edward Fridenberg, Aristides Agramonte, E. Styles Potter, Thomas A. McNicholl, F. Ferguson.

The Secretary then presented the

Report of the Committee on Publications.

The Committee on Publications felt that the work of printing and distributing the volumes of Transactions had been more economically and satisfactorily done by the Republican Press Association than by the other printing houses that had done work for the Association; consequently the printing of Volume 10 was given to that firm at its place of business in Concord, N. H.

An edition of one thousand copies was printed, and distributed so far as required. The total cost of the volumes, aside from reporting and the distributing charges for the copies sent out from the office of the Treasurer, was $1,328.59.

The committee calls attention to the first decennial index placed at the end of the volume, and the suggestion is made, that the continuance

of a decennial index would be a wise provision for the usefulness of our Transactions. The editor is aware of the defects in the present index, but as incomplete as it is, it will materially facilitate reference to the volumes, and in particular, where the author's name is known, it will be found quite full and, it is believed, quite reliable. The editor endeavoured to have some of the work on the index done by other than his own hands, but after expending twenty dollars in clerical work, he found that the errors and omissions were so numerous that he was obliged to do it personally, or rather that the verification of the work of others was nearly as arduous as doing the work itself.

[Signed] E. D. FERGUSON,
Chairman and Editor.

The report was accepted.

The Council then listened to the

ANNUAL REPORT OF THE TREASURER FROM OCTOBER 1, 1893, TO OCTOBER 1, 1894.

RECEIPTS—GENERAL FUND.

Balance from last report	$1,848.61	
Dues	2,380.00	
Initiation fees	180.00	
Sale of Transactions	16.00	
Interest	45.00	
		$4,469.61

DISBURSEMENTS.

Sundries, including expenses of Transactions	$1,798.47	
Postage stamps	103.00	
Expressage and freight	56.13	
		1,957.60
Balance in General Fund, October 1, 1894		$2,512.01

LIBRARY AND BUILDING FUND.

Amount from last report	$2,643 41	
Interest	95.50	
		2,738.91
Total funds in the treasury, October 1, 1894		$5,250.92

During the year there has been a net increase in the funds of the Association of $758.89. Although this exceeds the increase for the preceding year by more than $500, still it would have been materially larger but for the slowness on the part of many of the members in paying their dues.

[Signed] E. D. FERGUSON,
Treasurer.

Report accepted.

The Secretary then offered the following

MEMORANDA.

The year just closed has been an eventful one in the history of the Association. It has been marked by the issuance of our tenth volume of Transactions, and so closes our first ten years of work. It is needless to speak of our volumes of Transactions—they speak for themselves. There is one event of the year, however, that requires notice at this time, and that is our relations to the American Medical Association. Ten years ago (on February 4, 1884) this Association was organised, and one of the main purposes of that organisation was to uphold and maintain the position of the American Medical Association towards the profession in this state.

It is needless to dwell upon the fact that the founding of this Association arose from an abrogation of the American code of medical ethics in this state, but after reinstating that ethical standard and endeavouring to maintain it for nearly ten years, we were confronted with the fact that an effort was being made in the national organisation itself, to so modify the code that some of the fundamental provisions would be changed to be in accord with the so-called new code which existed for nine years in this state, and then was abolished by its own inventors. As it is impossible to feel assured in advance of the action of a deliberative body, particularly when it draws its members from so wide an extent of territory as the United States, most of us felt that a critical period for the profession in America was at hand, and during the three years that the subject has been held before the profession by constitutional conditions, *i. e.*, at the meetings held at Detroit in 1892, at Milwaukee in 1893, and at San Francisco in 1894, much anxiety was felt, and some effort was made to present the matter in its true light before the profession throughout the country. This was the more necessary from the fact that not only was it proposed to modify and emasculate the code, but certain amendments to the Constitution and By-Laws were devised, whereby, should the proposed changes in the code fail of adoption, the amended Constitution would provide for the adoption of the amended code in the near future. It may be well for the writer to give some extracts from a communication by him, printed in the *Journal of the American Medical Association* just before the San Francisco meeting, in which he endeavoured to show the objects and effects of the proposed changes.

* * * * * * *

"The first radical and fundamental change provided for, consists in the abolishing of delegates—who at present are the voters at the meetings—and the introduction of a provision for a *general acting and voting membership*. This would place the affairs of the Association in the hands of the members of the profession residing in the vicinity of the place of meeting. This amounts to an endeavour to apply the methods of the

town-meeting (invaluable in their proper spheres), to affairs having a national importance. It is consequently undemocratic, in that it would allow a small and sectional portion to act for the whole, and to cite the British Association as an instance of the successful application of the proposed methods is specious and misleading, as a moment's reflection on the relative territorial extent and density of population would show.

The importance of the questions to be decided at the approaching meeting should be ample illustration of the danger which might arise in leaving the Association in the hands of the voters of a certain locality, which locality may by wily methods be selected for certain but concealed purposes, for language is said, at times, to conceal thoughts.

This radical change in the legislative methods of the Association should be considered in connection with certain other proposed amendments which are not found in direct relationship or order of verbal sequence, but are found by adding together detached but related items. Some of these disarticulated provisions give the following results:

1. It is provided that the chairman of each Section shall appoint a Nominating Committee ("consisting, if practicable, of ex-chairmen of the Section"), to nominate Section officers.

2. The Executive Committee of each Section shall consist of the chairman of the Section and his predecessors in that office for the two years just passed.

3. The Executive Committees of the several Sections shall meet together and constitute a General Business Committee.

4. Much of the business of the Association is to be referred to this General Business Committee without debate.

5. This same Business (Should we say *Busy*?) Committee is to be the Nominating Committee.

If the revisers of the Constitution intended to offer provisions whereby the wishes of the whole profession, in all parts of the country, could find expression in the proceedings and acts, in the management of the affairs, and in the official *personnel* of the Association, their schemes must prove a signal failure, for a better plan for a close corporation could hardly be conceived. These provisions are in every way anachronisms, unless governmental methods are to evolute backward.

I shall not accuse the Committee of an intention to place the control of the Association in the hands of a few men, nor will I press my objections closer by urging that in this scheme the general practitioners, who still constitute the large majority of the profession, will find that they can have only a very limited share in the official work of the Association. As a matter of fact, the present organisation, when contrasted with this new scheme, would illustrate a republican and representative liberty in contrast with a probable oligarchy. And all this, we were told at Milwaukee, is to be done for the interests of the Association and for the advancement of scientific medicine. *Is* it true that words are means for concealing thoughts? Let any one weigh carefully the natural tendency of the provisions for the government of the Association to which I have called attention, and then consider if it can be truthfully claimed that

log-rolling has existed under our present plan of organisation, what should be the estimate as to the probable evils in that direction under the new *régime?*

* * * * * * *

And now a few words concerning the Code. I will take as my text an extract from the Milwaukee "Proem," in which they say: "The Committee deprecates all efforts to abolish, belittle, distort, ridicule, or otherwise lessen its hold upon the profession." As a matter of fact, the adoption of this *newest* Code would do each and every one of those five things, only it would come in the reverse order of their statement. It took ten years to go through a similar process in the state of New York. *Facile descensus.*

The dignified and pure English of our present Code has been the subject of frequent comment, and while wishing to avoid any mere verbal criticism of the Code reported by the committee, I feel it is but right to state that its principal claims for credit as a composition lie in the large extracts it has received from the old Code. But, without stopping to specify such points of comparison, which though important are not of first interest, we may briefly consider a few of the radical changes from the provisions of our present Code.

In their preliminary report at Milwaukee, the committee were at considerable pains to show that a specialist and general practitioner are not fit parties to a consultation, and the inference is that the average physician is only the guide-board to the office of the specialist, or the quasi usher for that individual.

It is submitted that no provision in a Code is necessary to show *how* a physician may relinquish the care of a patient, when the motive is purely personal, but it is proper that specialists should be kept in mind of the fact that general practitioners exist who are competent to discuss with them questions relating to their special fields, and it should be freely conceded that there are specialists who are competent to discuss cases from the standpoint of the general physician. As a matter of common courtesy, the physician is entitled to a full consultation if he desires it, and no presumption to the contrary should be created. I believe that all well qualified and well disposed physicians and specialists will accept that proposition.

We should remember in this part of the question that the *sedilia* of infallibility abides neither with the physicians nor with the specialists, and that "honours are easy" so far as errors are concerned.

* * * * * * *

As to the provision which allows consultations with "legally qualified practitioners," the object is so apparent as to require no comment, for without the limitations made by the old Code, in most of the states it would virtually allow consultations with all the varieties of charlatans, for the *respectability* of the *licensing board* would be a matter of taste.

One word concerning patent rights and proprietary medicines. Jus-

tice is always to be honoured and sought; but justice is not always to be found, particularly by a superficial consideration of a case. No honourable means for pecuniary advancement should be closed to members of the profession, but if our surgeons are to furnish a quota of itinerant venders of the latest modifications of forceps, scissors, and *snares*, and specialists with stethoscopes, ophthalmoscopes, etc., or ingenious physicians, with a turn for chemistry and the "main chance," should conclude to patent the latest "extract," and all be added to the hordes of non-professional representatives of business firms who now invade our offices, who is to protect the general practitioner who seems to be the natural prey of such schemes and schemers? We would need some additions to the litany of defense and deliverance.

As a matter of fact, how many instances of invention of surgical appliances can be adduced where notable pecuniary profit would naturally follow a patent, at least sufficient to justify the sorry spectacle of a scramble for success in the sale of rival inventions? There is one solution of the question, and it seems the only one, *i. e.*, if the invention is likely to be more profitable than the honours and rewards connected with strictly professional work, then let the inventor cease to practice medicine and surgery, patent his "machine," and enter upon the strictly business methods belonging to its manufacture and sale.

* * * * * * *

This new Code, we should remember, is practically a twentieth century code, and yet let us pause a moment, only a moment, to consider its provision relative to advertising. After following the language of the old Code so as to condemn and prohibit advertising *by the general physician*, the revisers add: "It shall not be considered a violation of the spirit of this section, however, for physicians engaged in the work of medical education, either singly or associated in colleges, or for *physicians practising in hospitals, whether public or private, general or special, to announce the fact or allow it to be announced to the profession in the advertising pages of strictly medical journals, or for physicians devoting special attention to one of the recognised special departments of medical practice, to note the fact on their signs or private cards.*"

Who is to decide on the list of "strictly medical journals?" Let us pause and think of the deluge of that kind of literature which the postman brings almost daily. Is it not another notice to the family physician to hide his diminished and still diminishing head? Pah! The thing is offensive. The proper limitations have been fixed by long usage interpreted by the present Code, and this new provision would prove to be the thin edge of a very large wedge which would split off all that has been retained of good from the old Code in relation to the subject."

* * * * * * *

As one of your delegates to the San Francisco meeting, it fell to the writer to take a somewhat active part before that meeting in the consideration of these amendments. The reports of the majority and minority

of the Committee on Revision had been printed for some time, but it seems that the objections to the report favouring revision had been so widespread and so pungent that the majority of the committee became alarmed, and although only one of their number was present at the meeting (the chairman, who read their report), what was our surprise to find that they had reconsidered their printed report and presented a modified report. *This modified report was first presented when we had assembled at a previously appointed time to consider the reports and act on them, and the modification was so deftly made as to seem to remove many of the objections*, but it was quickly found that the ultimate result would be the same.

The minority report, made by Dr. Didama, was substituted for the majority report, and after a full consideration by means of the various motions and explanations incident to such affairs, the Constitution, By-Laws, and Code remained unchanged by a majority of nearly three to one.

The writer regrets that he was the only representative of the Council at the meeting, and that our whole Association had only seven delegates in attendance. The expense and labour attendant on going to the meeting were large, but the interests at stake required a larger delegation.

During the winter just passed, the attention of the Secretary was called to the following advertisement in a Binghamton paper of the date of January 4, 1894, viz., "Consumption, Asthma. and Bronchitis are permanently cured by the Ingraham Treatment! Administered only at the Mount Prospect Medical Institute, 80 to 90 Prospect St., Binghamton, N. Y. Send for circular containing full information and many testimonials. Address Dr. C. W. Ingraham, P. O. Box 154, Binghamton, N. Y." I wrote to Dr. Ingraham that I felt it my duty to remove his name from our list on account of unprofessional conduct in thus advertising in an open and notorious manner, that I had done so, and would report the fact to the Council for approval. I felt that the case was so flagrant that no ceremony was required.

By vote the action of the Secretary was sustained in the case of Dr. C. W. Ingraham.

The chairman of the library then presented the

Tenth Annual Report of the Library Committee of the New York State Medical Association.

October 8, 1894.

This tenth annual report of the library committee shows an increase of 181 volumes over the last report. On October 9, 1893, the library contained 9,045 volumes. Since that date, 181 volumes have been received, making a total of 9,226 volumes. Transactions of different medical

societies are obtained through exchange for the Transactions of this Association. Several medical journals are regularly placed upon the tables, and pamphlets, reports, and other documents are sent by their authors to the library. Two hundred and twenty-five visits were made to the library during the current year by Fellows of the Association, other physicians, medical students, and laymen.

J. W. S. GOULEY, M. D.,
Director of the Library and Chairman of the Committee.

The report was adopted.

Bill of Angell, for printing, for $48.25, audited and allowed.

The Council adjourned.

[Signed] E. D. FERGUSON,
Secretary.

The Council for 1894–'95 met at the office of Dr. J. W. S. Gouley immediately on the adjournment of the annual meeting of the Association.

Present: Drs. Flint, Bryant, Denison, Ferguson, Gouley, Townsend, and Truax.

On motion, the members of the Council residing in the second district were constituted the committee on publications, with the secretary as chairman and editor.

It was then voted that $100 be given this year to the trustees of the Mott Memorial Library in addition to the $100 paid annually.

The members of the Council residing in the fifth district were designated as the committee of arrangements, and they were authorised to add to their number.

The annual meeting for 1895 was then appointed to be held on October 15, 16, and 17.

The account of the committee of arrangements, for postage amounting to $35.10, was audited and approved.

The Council then adjourned.

[Signed] E. D. FERGUSON,
Secretary.

LIST OF FELLOWS.

BY DISTRICT AND COUNTY.

FIRST OR NORTHERN DISTRICT.

FRANKLIN COUNTY.

Founder.	Gillis, William.	Fort Covington.

1

FULTON COUNTY.

Original.	Blake, Clarence R.	Northville.
Founder.	de Zouche, Isaac.	Gloversville.
	Drake, D. Delos.	Johnstown.
	Edwards, John.	Gloversville.

4

HAMILTON COUNTY.

	McGann, Thomas.	Wells.

1

HERKIMER COUNTY.

	Casey, J. E.	Mohawk.
	Douglass, A. J.	Ilion.
	Garlock, William D.	Little Falls.
Original.	Glidden, Charles H.	Little Falls.
	Greene, H. H.	Paine's Hollow.
Original.	Potter, Vaughan C.	Starkville.
Original.	Sharer, John P.	Little Falls.
Original.	Southworth, Mark A.	Oakland, Cal.
Original.	Young, John D.	Starkville.

9

JEFFERSON COUNTY.

Founder.	*Abell, Ira H.	Antwerp.
Founder.	Crawe, J. Mortimer.	Watertown.
Original.	Johnson, Parley H.	Adams.

3

LEWIS COUNTY.

	Crosby, Alexander H.	Lowville.
	Douglass, Charles E.	Lowville.
	Joslin, Albert A.	Martinsburgh.
	Kelley, John D.	Lowville.

4

MONTGOMERY COUNTY.

Original.	Ayers, Douglas.	Fort Plain.
	Caldwell, Nathan A.	Hageman's Mills.
	French, S. H.	Amsterdam.
Original.	Graves, Ezra.	Amsterdam.
Original.	Johnson, Richard G.	Amsterdam.
	Klock, Charles M.	St. Johnsville.
Original.	Leach, H. M.	Charlton City, Mass.
	Meyer, George L.	Stone Arabia.
	Parr, John.	Buell.
	Parsons, W. W. D.	Fultonville.
Founder.	Robb, William H.	Amsterdam.
	Simons, Frank E.	Canajoharie.
	Smyth, Arthur V. H.	Amsterdam

13

ONEIDA COUNTY.

	Armstrong, James A.	Clinton.
	Babcock, H. E.	New London.
Original.	Bagg, Moses M.	Utica.
	Barnum, D. Albert.	Cassville.
Original.	Blumer, G. Alder.	Utica.
	Bond, George F. M.	Utica.
Original.	Booth, Wilbur H.	Utica.
Original.	Brush, Edward N.	Towsen, Md.
	Churchill, Alonzo.	Utica.
	Clarke, Wallace.	Utica.
	Dodge, Amos P.	Oneida Castle.

*Deceased.

Douglass, James W. Booneville.
Ellis, J. B. Whitesborough.
English, G. P. Booneville.
Fitzgerald, John F. Rome.
Flandrau, Thomas M. Rome.
Fraser, Jefferson C. Ava.
Fuller, Earl D. Utica.
Gibson, William M. Utica.
Holden, Arthur L. Utica.
Hughes, Henry R. Clinton.
Original. Hunt, James G. Utica.
Kuhn, William. Rome.
Munger, Charles. Knoxboro.
Nelson, William H. Taberg.
Nold, John B. Utica.
Palmer, Henry C. Utica.
Palmer, Walter B. Utica.
Phelps, George G. Utica.
Founder. Porter, Harry N. Washington, D. C.
Quin, Hamilton S. Utica.
Reid, Christopher C. Rome.
Russell, Charles P. Utica.
Scully, Thomas P. Rome.
Sutton, H. C. Rome.
Sutton, Richard E. Rome.
Swartwout, Leander. Prospect.
Tefft, Charles B. Utica.
West, Joseph E. Utica.

39

OSWEGO COUNTY.

Bacon, Charles G. Fulton.
Bates, Nelson W. Central Square.
Cooley, F. L. Oswego.
Cooley, R. N. Hannibal Centre.
Original. DeWitt, Byron. Oswego.
Huntington, John W. Mexico.
Johnson, George P. Mexico.
Marsh, E. Frank. Fulton.
Todd, John P. Parish.

9

ST. LAWRENCE COUNTY.

Cook, Guy Reuben. Louisville.

1

SECOND OR EASTERN DISTRICT.

ALBANY COUNTY.

	Abrams, H. C.	Newtonville.
Founder.	Bailey, Theodore P.	Albany.
	Haynes, John U.	Cohoes.
Founder.	Peters, Samuel.	Cohoes.
	Rulison, L. B.	West Troy.
Founder.	Sabin, William B.	West Troy.
Original.	Van Vranken, Adam T.	West Troy.
	Witbeck, Charles E.	Cohoes.
	Zeh, Merlin J.	West Troy.

9

CLINTON COUNTY.

Founder.	Dodge, Lyndhurst C.	Rouse's Point.
	Holcomb, O. A.	Plattsburgh.
Founder.	Lyon, E. M.	Plattsburgh.

3

COLUMBIA COUNTY.

Original.	Benham, John C.	Hudson.
	Bradley, O. Howard.	Hudson.
	Clum, Franklin D.	Cheviot.
	Fritts, Crawford Ellsworth.	Hudson.
Original.	Lockwood, J. W.	Philmont.
Original.	Smith, H. Lyle.	Hudson.
	Vedder, George W.	Philmont.
	Wheeler, John T.	Chatham.
Founder.	Wilson, Thomas.	Claverack.
	Woodruff, R. Allen.	Philmont.
	Woodworth, T. Floyd.	Kinderhook.

11

ESSEX COUNTY.

Founder.	Barton, Lyman.	Willsborough.
	Barton, L. G.	Willsborough.
	Church, Charles A.	Bloomingdale.
Original.	D'Avignon, Francis J.	Au Sable Forks.
Original.	LaBell, Martin J.	Lewis.
Original.	Riley, Andrew W.	Au Sable Forks.
Original.	Robinson, Ezra A.	Jay.
Original.	Turner, Melvin H.	Moriah.

8

GREENE COUNTY.

Original.	Conkling, George. Durham.
	Getty, A. H. Athens.
	Huestis, W. B. Kiskatom.
Original.	Selden, O. G. Catskill.
Original.	Selden, Robert. Catskill.

5

RENSSELAER COUNTY.

Original.	Allen, Amos. Grafton Centre.
Founder.	Allen, Charles S. Greenbush.
	Allen, William L. Greenbush.
	Baynes, Joseph E. Troy.
	Bissell, James H. Troy.
	Bonesteel, H. F. Troy.
Founder.	Bonesteel, William N. Troy.
Original.	Bontecou, Reed B. Troy.
	Boyce, Elias B. Averill Park.
Founder.	Burbeck, Charles H. Troy.
	Burton, Henry B. Troy.
Founder.	Burton, Matthew H. Troy.
	Cahill, John T. Hoosick Falls.
	Church, Thomas C. Valley Falls.
Original.	Cooper, William C. Troy.
	Crounse, Andrew C. Melrose.
	Dickinson, M. D. Troy.
	Dickson, Thomas Gordon. Troy.
Founder.	Ferguson, E. D. Troy.
Founder.	Finder, William. Troy.
	Greenman, C. E. Troy.
Founder.	Hannan, James C. Hoosick Falls.
	Hannan, Thomas H. Hoosick Falls.
Founder.	Harvie, J. B. Troy.
Original.	Heimstreet, Thomas B. Troy.
Original.	Houston, David W. Troy.
	*Hull, William H. Poestenkill.
	Hutton, M. B. Valley Falls.
	Keith, Halbert Lyon. Upton, Mass.
Original.	Lyon, George E. St. Louis, Mo.
	Lyons, Edward L. Troy.
Original.	Magee, Daniel. Troy.
	Marsh, James P. Troy.
Founder.	*Mitchell, Howard E. Troy.
	Morehouse, E. W. Troy.

* Deceased.

Founder. Nichols, Calvin E. Troy.
Founder. Nichols, William H. West Sand Lake.
Phelan, Michael F. Troy.
Original. Rogers, S. Frank. Troy.
Founder. Rousseau, Zotique. Troy.
Founder. Seymour, W. Wotkyns. Troy.
Original. Skinner, Smith A. Hoosick Falls.
Tompkins, Fred J. Lansingburgh.
Original. Traver, Richard D. Troy.
Ward, R. H. Troy.

45

SARATOGA COUNTY.

Allen, Henry J. Corinth.
Founder. Comstock, George F. Saratoga Springs.
Original. Crombie, Walter C. Mechanicsville.
Curtis, P. C. Round Lake,
Original. Dunlop, John J. Waterford.
Gow, Frank F. Schuylerville.
Founder. Grant, Charles S. Saratoga Springs.
Original. Hall, William H. Saratoga Springs.
Hewitt, Adelbert. Saratoga Springs.
Founder. Hodgman, William H. Saratoga Springs.
Hudson, George. Stillwater.
Humphrey, J. F. Saratoga Springs.
Inlay, Erwin G. Saratoga Springs.
Original. Johnson, Ianthus G. Greenfield Centre.
Keefer, Charles W. Mechanicsville.
Kniskern, A. C. Mechanicsville.
Moriarta, D. C. Saratoga Springs.
Original. Murray, Byron J. Saratoga Springs.
Palmer, F. A. Mechanicsville.
Parent, J. S. Birchton.
Original. Preston, John R. Schuylerville.
Founder. Reynolds, Tabor B. Saratoga Springs.
*Rice, George. Mechanicsville.
Sherer, John D. Waterford.
Sherman, F. J. Ballston.
Smith, F. A. Corinth.
Original. Stubbs, Roland H. Waterford.
Swan, William E. Saratoga Springs.
Swanick, A. A. Saratoga Springs.
Sweetman, J. T., Jr. Ballston.
Thompson, Amos W. Saratoga Springs.
Varney, Miles E. Saratoga Springs.

* Deceased.

Webster, W. B. Schuylerville.
Zeh, Edgar. Waterford.
34

SCHENECTADY COUNTY.

*Fuller, Robert. Schenectady.
Hammer, Charles. Schenectady.
Original. McDonald, George E. Schenectady.
McDougall, R. A. Duanesburgh.
Original. Reagles, James R. Schenectady.
Original. Van Zandt, Henry C. Schenectady.
Veeder, Andrew T. Pittsburgh, Pa.
7

SCHOHARIE COUNTY.

Original. Hagadorn, William. Gilboa.
Original. Kingsley, Henry F. Schoharie.
2

WARREN COUNTY.

Fitzgerald, David J. Glens Falls.

Original. Martine, Godfrey R. Glens Falls.
Montgomery, J. J. Luzerne.
3

WASHINGTON COUNTY.

Lambert, John. Salem.
Long, Alfred J. Whitehall.
2

THIRD OR CENTRAL DISTRICT.

BROOME COUNTY.

Allen, S. P. Whitney's Point.
Founder. Chittenden, Joseph H. Binghamton.
Dudley, Dwight. Maine.
Original. Ely, Henry Oliver. Binghamton.
Farnham, LeRoy D. Binghamton.

* Deceased.

Farrington, John M. Binghamton.
Forker, Frederick L. Binghamton.
Greene, Clark W. Chenango Forks.
Guy, J. D. Chenango Forks.
Original. Hills, Lyman H. Binghamton.
Hough, F. P. Binghamton.
Knapp, W. H. Union Centre.
Meacham, Isaac D. Binghamton.
Moore, William A. Binghamton.
Founder. Orton, John G. Binghamton.
Pierce, Edward A. Binghamton.
Pierson, G. E. Kirkwood.
Place, John F., Jr. Binghamton.
Founder. Putnam, Frederick W. Binghamton.
Original. Race, W. F. Kearney, Neb.
Founder. Richards, Charles B. Binghamton.
Rodgers, Harris C. Binghamton.
Seymour, Ralph A. Whitney's Point.
Slater, Frank Ellsworth. Binghamton.
Wagner, Charles Gray. Binghamton.
Wells, E. H. Binghamton.

26

CAYUGA COUNTY.

Original. Kenyon, M. Moravia.
Original. Laird, William R. Auburn.
Founder. Sawyer, Conant. Auburn.
Original. Tripp, John D. Auburn.

4

CHEMUNG COUNTY.

Original. Brown, Charles W. Washington, D. C.
Drake, E. G. Elmira.
Original. Ross, Frank W. Elmira.
Squires, Charles L. Elmira.
Original. Wales, Theron A. Elmira.

5

CHENANGO COUNTY.

Original. Blair, Louis P. McDonough.
Original. Brooks, Leroy J. Norwich.
Copely, Herman D. Bainbridge.
Douglas, George. Oxford.
Hand, S. M. Norwich.
Hayes, Philetus A. Afton.

Original. Johnson, Leonard M. Greene.
Original. Lyman, H. C. Sherburne.
Noyes, James B. New Berlin.
Packer, Thurston G. Smyrna.
Smith, Samuel L. Smithville.
Thompson, R. A. Norwich.
Van Wagner, L. A. Sherburne.
Williams, George O. Greene.
14

CORTLAND COUNTY.

Bradford, George D. Homer.
Original. Clark, DeWitt. Marathon.
Didama, E. A. Cortland.
Halbert, M. L. Cincinnatus.
Founder. Hendrick, Henry C. McGrawville.
Higgins, F. W. Cortland.
Founder. Jewett, Homer O. Cortland.
Kenyon, Benjamin. Cincinnatus.
Reese, Frank D. Cortland.
9

DELAWARE COUNTY.

Drake, James B. Hancock.
Morrow, William B. Walton.
Smith, George C. Delhi.
Travis, Edward M. Eagle Grove, Ia.
4

MADISON COUNTY.

Original. Birdsall, Gilbert. N. Brookfield.
Burhyte, O. W. Brookfield.
Cavana, Martin. Oneida.
Original. Carpenter, Henry W. Oneida.
Drake, Frank C. Oneida.
Huntley, James F. Oneida.
Miles, George W. Oneida.
Original. Nicholson, A. R. Madison.
8

ONONDAGA COUNTY.

Original. Aberdein, Robert. Syracuse.
Founder. Allen, Henry B. Baldwinsville.
Brown, Ulysses H. Syracuse.

	Campbell, A. J.	Syracuse.
Founder.	Dallas, Alexander J.	Syracuse.
Founder.	Didama, Henry D.	Syracuse.
Original.	Donohue, Florence O.	Syracuse.
	Earle, George W.	Tully.
Original.	Edwards, Amos S.	Syracuse.
Original.	Edwards, George A.	Syracuse.
	Flanigan, John R.	Syracuse.
	Frazee, A. Blair.	Elbridge (Altoona, Pa.).
Original.	Hatch, C. A.	Syracuse.
Founder.	Head, Adelbert D.	Syracuse.
Original.	Jacobson, Nathan.	Syracuse.
Founder.	Kneeland, Jonathan.	South Onondaga.
	Magee, Charles M.	Syracuse.
Original.	McNamara, Daniel.	Syracuse.
Original.	Munson, W. W.	Otisco.
Founder.	Parsons, Israel.	Marcellus.
Original.	Saxer, Leonard A.	Syracuse.
	Sears, F. W.	Syracuse.
Founder.	Van de Walker, Ely.	Syracuse.
Original.	Whitford, James.	Onondaga Valley.

24

OTSEGO COUNTY.

Original.	Barney, C. S.	Milford.
	Church, B. A.	Oneonta.
	Ford, M. L.	Oneonta.
Founder.	Leaning, John K.	Cooperstown.
Original.	Martin, John H.	Otego.
Original.	Merritt, George.	Cherry Valley.
Original.	Sweet, Joseph J.	Unadilla.
	Sweet, Joshua J.	Unadilla.

8

SCHUYLER COUNTY.

	King, James K.	Watkins.
	Roper, P. B.	Alpine.
	Leffingwell, E. D.	Watkins.
	Smelzer, Baxter T.	Havana.
	Woodruff, E. Gerald.	Watkins.

5

SENECA COUNTY.

	Bellows, George A.	Waterloo.
	Blaine, Myron D.	Willard.

Founder. Lester, Elias. Seneca Falls.
Original. Pilgrim, Charles W. Willard.
Seaman, Frank G. Senaca Falls.
Welles, S. R. Waterloo.
6

TIOGA COUNTY.

Original. Ayer, W. L. Owego.
Cady, George M. Nichols.
2

TOMPKINS COUNTY.

Founder. Beers, John E. Danby.
Biggs, Chauncey P. Ithaca.
Flickinger, John. Trumansberg.
3

FOURTH OR WESTERN DISTRICT.

ALLEGHANY COUNTY.

Original. Wakely, Benjamin C. Angelica.
1

CATTARAUGUS COUNTY.

Eddy, John L. Olean.
Ellsworth, Victor A. Boston, Mass.
Lake, Albert D. Gowanda.
Mudge, Selden J. Olean.
Original. Tompkins, Orrin A. East Randolph.
5

CHAUTAUQUA COUNTY.

Founder. Ames, Edward. Kalamazoo, Mich.
Bemus, Morris N. Jamestown.
Bemus, William Marvin. Jamestown.
Founder. Dean, Harmon J. Brocton.
Richmond, Nelson G. Fredonia.
Rolph, R. T. Fredonia.
Founder. Strong, Thomas D. Westfield.
7

ERIE COUNTY.

	Andrews, Charles H. Holland.
Founder.	*Andrews, Judson B. Buffalo.
Original.	Atwood, H. L. Collins Centre.
Original.	Banta, Rollin L. Buffalo.
Original.	Bartlett, Frederick W. Buffalo.
	Bergtold, W. H. Buffalo.
Original.	Boies, Loren F. East Hamburgh.
Original.	Briggs, Albert H. Buffalo.
	Brooks, Mark N. Springville.
	Brown, George L. Buffalo.
	Bryant, Percy. Buffalo.
	Burghardt, Francis Augustus. Buffalo.
	Clendenan, C. W. N. Tonawanda.
	Cohen, Bernard. Buffalo.
	Congdon, Charles E. Buffalo.
Founder.	Cronyn, John. Buffalo.
Original.	Dagenais, Alphonse. Buffalo.
Original.	Daniels, Clayton M. Buffalo.
	Dayton, C. L. Buffalo.
Original.	Dorland, Elias T. Buffalo.
	Fell, George E. Buffalo.
	Fowler, Joseph. Buffalo.
	Frederick, Carlton C. Buffalo.
	Gould, Cassius W. Buffalo.
	Green, Stephen S. Buffalo.
Original.	Greene, DeWitt C. Buffalo.
Founder.	Greene, Joseph C. Buffalo.
Original.	Greene, Walter D. Buffalo.
Original.	Harrington, D. W. Buffalo.
	Hartwig, Marcell. Buffalo.
	Hayd, Herman E. Buffalo.
	Heath, William H. Buffalo.
	Himmelsbach, George A. Buffalo.
	Howard, Charles F. Buffalo.
Founder.	Hoyer, F. F. Tonawanda.
	Hubbell, Alvin A. Buffalo.
	Hunt, H. L. Orchard Park.
	Ingraham, Henry D. Buffalo.
	Jackson, William H. Springville.
Original.	Johnson, Thomas M. Buffalo.
	Jones, Allen A. Buffalo.
	Lapp, Henry. Clarence.
	Long, Ben. D. Buffalo.
	Macfarlane, William A. Springville.
Original.	Murray, William D. Tonawanda.

*Deceased.

Park, Roswell. Buffalo.
Original. Pettit, John A. Buffalo.
Phelps, William C. Buffalo.
Pohlman, Julius. Buffalo.
Rochester, DeLancy. Buffalo.
Stockton, Charles G. Buffalo.
Strong, Orville C. Colden.
Taber, R. C. Tonawanda.
Thornton, William H. Buffalo.
Founder. Tremaine, William S. Buffalo.
Trull, H. P. Williamsville.
Twohey, John J. Buffalo.
Wall, Charles A. Buffalo.
Wheeler, Isaac G. Marilla.
Whipple, Electa B. Buffalo.
Willoughby, M. Buffalo.
Founder. Wyckoff, Cornelius C. Buffalo.

62

GENESEE COUNTY.

Andrews, Lewis B. Byron.
Original. Crane, Frank W. Corfu.
Founder. Jackson, Albert P. Oakfield.
Prince, Alpheus. Byron.
Stone, Frank L. Le Roy.
Founder. Townsend, Morris W. Bergen.

6

LIVINGSTON COUNTY.

Original. Briggs, William H. Hemlock Lake.
Brown, J. P. Tuscarora.
Dodge, Frank H. Mount Morris.
Jones, George H. Fowlerville.
Kneeland, B. T. Dalton.
Original. Menzie, R. J. Caledonia.
Original. Moyer, Frank H. Moscow.

7

MONROE COUNTY.

Original. Backus, Ogden. Rochester.
Original. Buckley, James. Rochester.
Original. Burke, John J. A. Rochester.
Curtis, D. F. Rochester.
Original. Dunning, J. D. Webster.
Fenno, Henry M. Rochester.

	Goler, George W.	Rochester.
Founder.	Hovey, B. L.	Rochester.
	Jones, S. Case.	Rochester.
	Maine, Alva P.	Webster.
	McDougall, William D.	Spencerport.
Founder.	Moore, Edward M.	Rochester.
Original.	Moore, Edward M., Jr.	Rochester.
Original.	Moore, Richard Mott.	Rochester.
Original.	O'Hare, Thomas A.	Rochester.
Original.	Pease, Joseph.	Hamlin.
	Reitz, Charles.	Webster.
	Schopp, Justin H.	Rochester.
	Snook, George M.	Parma.
	Stockschlaeder, P.	Rochester.

20

NIAGARA COUNTY.

	Eddy, George P.	Lewiston.
	Huggins, William Q.	Sanborn.

2

ONTARIO COUNTY.

Original.	Allen, Duncan S.	Seneca.
Original.	Allen, James H.	Gorham.
Founder.	Bentley, Francis R.	Cheshire.
	De Laney, John Pope.	Geneva.
Original.	Hicks, W. Scott.	Bristol.
Founder.	Nichols, H. W.	Canandaigua.
	Pratt, Frank R.	Manchester.
Founder.	Simmons, E. W.	Canandaigua.
Original.	Vanderhoof, Frederick D.	Phelps.

9

ORLEANS COUNTY.

Original.	Bailey, William C.	Knoxville, Tenn.
Founder.	Chapman, James.	Medina.
	Curtis, Daniel.	Jeddo.
Original.	Taylor, John H.	Holley.
Founder.	Tompkins, H. C.	Knowlesville.

5

STEUBEN COUNTY.

	Chittenden, Daniel J.	Addison.
Original.	Dunn, Jeremiah.	Bath.

Original. Ellison, Metler D. Canisteo.
Gilbert, Horatio. Hornellsville.
Hubbard, Chauncey G. Hornellsville.
Hunter, Nathaniel P. Jasper.
Original. Jamison, John S. Hornellsville.
Original. *Perry, Nathaniel M. Troupsburgh.
Rudgers, Denton W. Hornellsville.
Wallace, Edwin E. Jasper.
10

WAYNE COUNTY.

Founder. Arnold, J. Newton. Clyde.
Brandt, J. S. Ontario Centre.
Founder. Colvin, Darwin. Clyde.
Horton, David B. Red Creek.
Original. Ingraham, Samuel. Palmyra.
Original. Landon, Newell E. Newark.
Nutten, Wilbur F. Newark.
Original. Sprague, John A. Williamson.
Sprague, L. S. Williamson.
Original. Young, Augustus A. Newark.
10

WYOMING COUNTY.

Original. Ellinwood, A. G. Attica.
Fisher, John C. Warsaw.
Greene, Cordelia A. Castile.
Hulette, G. S. Arcade.
Lusk, Zera J. Warsaw.
Original. Palmer, George M. Warsaw.
Original. Rae, Robert. Portageville.
7

YATES COUNTY.

Oliver, William. Penn Yan.
1

FIFTH OR SOUTHERN DISTRICT.

DUTCHESS COUNTY.

Baker, Benjamin N. Rhinebeck.
Original. Barnes, Edwin. Pleasant Plains.

*Deceased.

Barton, Thomas J. Tivoli.
Original. Bates, Xyris T. Poughkeepsie.
Original. Bayley, Guy Carleton. Poughkeepsie.
Founder. Codding, George H. Amenia.
Founder. Cramer, William. Poughkeepsie.
Original. Fletcher, Charles L. Wing's Station.
Howland, George T. Poughkeepsie.
Julian, John M. Pleasant Valley.
Founder. Kittridge, Charles M. Fishkill-on-Hudson.
Founder. Leroy, Irving D. Pleasant Valley.
Founder. Porteous, James G. Poughkeepsie.
Founder. Pultz, Monroe T. Stanfordville.
Van Etten, Cornelius. Rhinebeck.
Original. Van Wyck, Richard C. Hopewell Junction.

16

KINGS COUNTY.

Alleman, L. A. W. Brooklyn.
Baker, Frank R. Brooklyn.
Founder. Baker, George W. Brooklyn, E. D.
Beardsley, William E. Brooklyn.
Bierwirth, Julius C. Brooklyn.
Original. Biggam, William H., Jr. Brooklyn.
Original. Brundage, Amos H. Brooklyn.
Original. Conway, John Francis. Brooklyn.
Coffin, Laurence. Brooklyn.
Creamer, Joseph, Jr. Brooklyn, E. D.
Criado, Louis F. Brooklyn.
Feeley, James F. Brooklyn, E. D.
Gardiner, William F. Brooklyn.
Hicks, Edward E. Brooklyn.
Hughes, Peter. Brooklyn.
Hull, Thomas H. Brooklyn.
Original. Ilgen, Ernst. Brooklyn.
Original. Jenkins, John A. Brooklyn, E. D.
Jewett, F. A. Brooklyn.
Original. Leighton, Nathaniel W. Brooklyn.
Little, Frank. Brooklyn.
Original. Lloyd, T. Mortimer. Brooklyn.
Original. Lung, Jesse B. Brooklyn.
Original. McCollom, William. Brooklyn.
Milbury, Frank S. Brooklyn.
Original. Minard, E. J. Chapin. Brooklyn.
Newman, George W. Brooklyn.
Original. North, Nelson L. Brooklyn.
Ostrander, George A. Brooklyn.
Page, Emmett D. Brooklyn.

Original. Paine, Arthur R. Brooklyn.
Original. Pray, S. R. Brooklyn.
Price, Henry R. Brooklyn.
Raynor, F. C. Brooklyn.
Reed, Henry B. Brooklyn.
Richardson, John E. Brooklyn.
Risch, Henry F. W. Brooklyn.
Rochester, Thomas M. Brooklyn.
Founder. Rushmore, John D. Brooklyn.
Original. Russell, William G. Brooklyn.
Founder. Segur, Avery. Brooklyn.
Original. Shepard, A. Warren. Brooklyn.
Original. Sizer, Nelson Buell. Brooklyn.
Founder. Squibb, Edward H. Brooklyn.
Founder. Squibb, Edward R. Brooklyn.
Original. Steinke, Carl Otho Hermann. Brooklyn.
Sullivan, John D. Brooklyn.
Thwing, Clarence. Fort Wrangel, Alaska.
Waterworth, William. Brooklyn.
Original. Wieber, George. Brooklyn.
Original. Williams, William H. Brooklyn.
Wright, Jonathan. Brooklyn.
Founder. Wyckoff, Richard M. Brooklyn.

53

NEW YORK COUNTY.

Adams, Calvin Thayer. New York.
Agramonte, Aristides. New York.
Agramonte, E. V. New York.
Original. Allen, S. Busby. New York.
Allen, Thomas H. New York.
Andrews, John L. New York.
Arango, Augustin. New York.
Original. Arcularius, Lewis. New York.
Armstrong, S. T. New York.
Original. Arnold, Edmund S. F. New York.
Arnold, Glover C. New York.
Baldwin, F. A. New York.
Bermingham, Edward J. New York.
Original. Biggs, Herman M. New York.
Founder. Bozeman, Nathan. New York.
Bozeman, Nathan G. New York.
Brodrick, William P. New York.
Original. Bryant, Joseph D. New York.
Original. Buchanan, Alexander. New York.
Original. Bull, Charles Stedman. New York.
Bull, William T. New York.

Original. Burchard, Thomas H. New York.
Campbell, Clarence G. New York.
Carr, William. New York.
Original. Carter, H. Skelton. New York.
Original. Chauveau, Jean F. New York.
Original. Chrystie, T. M. Ludlow. New York.
Collins, Stacy B. Seaford, Sussex Co., Del.
Comfort, John E. New York.
Founder. Conover, William S. New York.
Conway, John R. New York.
Cook, Almon H. New York.
Original. Curry, Walker. New York.
Dallas, Alexander. New York.
Daniels, F. H. New York.
Davis, J. Griffith. New York.
Davis, Robert C. New York.
De Garmo, W. B. New York.
Delphey, Eden V. New York.
Dench, Edward B. New York.
Original. Denison, C. Ellery. New York.
Original. Denison, Ellery. New York.
Founder. Dennis, Frederic S. New York.
de Quesada, Gregorio J. New York.
Drake, W. F. New York.
Original. Du Bois, Matthew B. New York.
Dudley, A. Palmer. New York.
Dunham, Edward K. New York.
Original. Eastman, Robert W. New York.
Einhorn, Max. New York.
Original. Eliot, Ellsworth. New York.
Enders, Thomas Burnham. New York.
Erdmann, John F. New York.
Farrington, Edward S. New York.
Farrington, Joseph O. New York.
Ferguson, Frank, New York.
Field, Matthew D. New York.
Founder. Flint, Austin. New York.
Flint, Austin, Jr. New York.
Founder. Flint, William H. New York.
Foster, George V. New York.
Frankenberg, Jacob H. New York.
Fridenberg, Edward. New York.
Original. Furman, Guido. New York.
Gleitsmann, J. W. New York.
*Goldthwaite, Henry. New York.
Founder. Gouley, John W. S. New York.
Grauer, Frank. New York.

*Deceased

Gray, Joseph F. New York.
Gulick, A. Reading. New York.
Gulick, Charlton R. New York.
Hammond, Frederick Porter. New York.
Original. Harrison, George Tucker. New York.
Haubold, H. A. New York.
Hepburn, Neil J. New York.
Hillis, Thomas J. New York.
Founder. Hinton, John H. New York.
Founder. Hodgman, Abbott. New York.
*Hogan, M. K. New York.
Holmes, Martha C. New York.
Hubbard, Dwight L. New York.
*Hubbard, George E. New York.
Founder. *Hubbard, Samuel T. New York.
Jackson, Charles W. New York.
Founder. Janeway, Edward G. New York.
Janvrin, J. E. New York.
Jenkins, William T. New York.
Judson, A. B. New York.
Kemp, William M. New York.
King, Ferdinand. New York.
Kneer, F. G. New York.
Knipe, George. New York.
Founder. Leale, Charles A. New York.
Lewis, Robert. New York.
Little, Albert H. New York.
Lockwood, Charles E. New York.
Ludlow, Ogden C. New York.
Lukens, Anna. New York.
Founder. Lusk, William T. New York.
Lynch, Patrick J. New York.
MacGregor, James R. New York.
Mackenzie, J. C. New York.
McAlpine, D. Hunter. New York.
McBurney, Charles. New York.
McGillicuddy, T. J. New York.
McGowan, John P. New York.
McIlroy, Samuel H. New York.
McLeod, Johnston. New York.
Founder. McLeod, S. B. Wylie. New York.
Original. McLochlin, James A. New York.
Original. McNamara, Laurence J. New York.
McNicholl, Thomas A. New York.
Maher, J. J. E. New York.
Founder. Manley, Thomas H. New York.
Marshall, Francis F. New York.

*Deceased.

Meier, Gottlieb C. H. New York.
Original. Miller, William T. New York.
Milliken, S. E. New York.
Original. Miranda, Ramon L. New York.
Original. Mitchell, Hubbard W. New York.
Moran, James. New York.
Mott, Valentine. New York.
Original. Murphy, John. New York.
Original. Murray, Sandford J. New York.
Original. Newman, Robert. New York.
Founder. Nicoll, Henry D. New York.
Original. Obendorfer, Isidor P. New York.
O'Brien, Frederick William. New York.
O'Brien, M. Christopher. New York.
Ochs, Benjamin F. New York.
O'Meagher, William. New York.
Oppenheimer, H. S. New York.
Oppenheimer, S. New York.
Painter, Henry McM. New York.
Palmer, Edmund J. New York.
Park, William Hallock. New York.
Parker, Ransom J. New York.
Original. Parsons, John. New York.
Perry, John Gardner. New York.
Phelps, Charles. New York.
Original. Pooler, Hiram A. New York.
Original. Porter, P. Brynberg. New York,
Potter, E. Styles. New York.
Pritchard, R. L. New York.
Pryor, William R. New York.
Founder. Purple, Samuel S. New York.
Ransom, H. B. New York.
Rau, Leonard S. New York.
Read, Ira B. New York.
Original. Ricketts, Benjamin M. Cincinnati, Ohio.
Roth, Julius A. New York.
Ruggles, Augustus D. New York.
Original. Sabine, Gustavus A. New York.
Sanders, E. New York.
Founder. Sayre, Lewis A. New York.
Sayre, Reginald H., New York.
Seaman, Louis L. New York.
Shaw, Henry B. New York.
Shea, Dennis L. New York.
Shrady, John. New York.
Shrady, John Eliot. New York.
Shunk, Albert. New York.
Silver, Henry M. New York.

Simmons, Charles E. New York.
Smeallie, James A. New York.
Smith, Alexander A. New York.
Original. Smith, J. Lewis. New York.
Original. Smith, Samuel W. New York.
Original. Smith, Stephen. New York.
Spicer, Walter E. New York.
Stewart, F. E. New York.
Strong, Cyrus J. New York.
Syms, Parker. New York.
Founder. Thomas, T. Gaillard. New York.
Thompson, Von Beverhout. New York.
Tiemann, Paul E. New York.
Truax, J. G. New York.
Founder. Tucker, Carlos P. New York.
Van Fleet, Frank. New York.
Vincent, Ludger C. New York.
Von Dönhoff, Edward. New York.
Original. Wallach, Joseph N. New York.
Walsh, Simon J. New York.
Founder. Ward, Charles S. New York.
Warner, Frederic M. New York.
Warner, John W. New York.
Weeks, John E. New York.
Weston, Albert T. New York.
White, Charles B. New York.
White, J. Blake. New York.
Founder. White, Whitman V. New York.
Founder. Wiener, Joseph. New York.
Wiggin, Frederick Holme. New York.
Williams, Henry Smith. New York.
Woodend, William E. New York.
Original. Wyeth, John A. New York.

196

ORANGE COUNTY.

Conner, Milton C. Middletown.
Davis, J. O. Howells.
Potts, E. Port Jervis.
Swartwout, H. B. Port Jervis.
Townsend, Charles E. Newburgh.
Vanderveer, J. C. Monroe.
Vanderveer, J. R. Monroe.

7

PUTNAM COUNTY.

Founder. Murdock, George W. Cold Spring.
Founder. Young, William. Cold Spring.

2

QUEENS COUNTY.

Original.	Burns, William J.	Sea Cliff.
Original.	Rave, Edward G.	Hicksville.

2

RICHMOND COUNTY.

	Johnston, Henry C.	New Brighton.
	Martindale, F. E.	Port Richmond.
	Walser, William C.	West New Brighton.

3

ROCKLAND COUNTY.

Founder.	*Govan, William.	Stony Point.

1

SUFFOLK COUNTY.

Original.	Chambers, Martin L.	Port Jefferson.
	Hamill, Edward H.	Newark, N. J.
	Hulse, William A.	Bay Shore.
Original.	Lindsay, Walter.	Huntington.

4

SULLIVAN COUNTY.

Original.	Bennett, Thomas W.	Jeffersonville.
	Crocker, Edwin.	Narrowsburgh.
	DeKay, William H.	Parksville.
	Johnston, N. C.	Barryville.
	McWilliams, F. A.	Monticello.
Original.	Munson, J. A.	Woodbourne.
	Piper, Charles W.	Wurtsborough.

7

ULSTER COUNTY.

Original.	Chambers, Jacob.	Kingston.
Original.	HoornBeek, Philip Du Bois.	Wawarsing.
Founder.	Hühne, August.	Rondout.
Original.	Hühne, Frederick.	Rondout.
Original.	Van Hovenberg, Henry.	Kingston.
	Ward, John J.	Ellenville.

6

* Deceased.

WESTCHESTER COUNTY.

	Acker, Thomas J.	Croton-on-Hudson.
Original.	Banks, George B.	Hartsdale.
Original.	Brush, Edward F.	Mount Vernon.
Original.	Coutant, Richard B.	Tarrytown.
Original.	Furman, J. Henry.	Tarrytown.
	Granger, William D.	Mount Vernon.
Original.	Huntington, Henry K.	New Rochelle.
Original.	Lyons, G. A.	New Rochelle.
Original.	Schmid, H. Ernst.	White Plains.
	Small, John W.	New Rochelle.
Original.	Southworth, Richmond Joseph.	Washington, D. C.
Original.	Wells, William L.	New Rochelle.

12

SUMMARY OF FELLOWSHIP BY DISTRICTS.

First District	84
Second District	129
Third District	118
Fourth District	152
Fifth District	309
Non-resident	8
Total Fellowship	800

46

ALPHABETICAL LIST OF FELLOWS.

*Abell, Ira H., Antwerp, Jefferson Co. Founder.
Aberdein, Robert, Warren and Fayette Sts., Syracuse, Onondaga Co. Original.
Abrams, H. C., Newtonville, Albany Co.
Acker, Thomas J., Croton-on-Hudson, Westchester Co.
Adams, Calvin Thayer, 13 W. 33d St., New York, New York Co.
Agramonte, Aristides, 144 W. 79th St., New York, New York Co.
Agramonte, E. V., 132 W. 98th St., New York, New York Co.
Alleman, L. A. W., 64 Montague St., Brooklyn, Kings Co.
Allen, Amos, Grafton, Rensselaer Co. Original.
Allen, Charles S., Greenbush, Rensselaer Co. Founder.
Allen, Duncan S., Seneca, Ontario Co. Original.
Allen, Henry B., Baldwinsville, Onondaga Co. Founder.
Allen, Henry J., Corinth, Saratoga Co.
Allen, James H., Gorham, Ontario Co. Original.
Allen, S. Busby, 1364 Lexington Ave., New York, New York Co.
Allen, S. P., Whitney's Point, Broome Co.
Allen, Thomas H., 52 W. 45th St., New York, New York Co.
Allen, William L., Greenbush, Rensselaer Co.
Ames, Edward, 123 E. Lovell St., Kalamazoo, Mich. Founder.
Andrews, Charles H., Holland, Erie Co.
Andrews, John L., 323 E. 86th St., New York, New York Co.
*Andrews, Judson B., State Hospital, Buffalo, Erie Co. Founder.
Andrews, Lewis B., Byron, Genesee Co.
Arango, Augustin, 125 E. 36th St., New York, New York Co.
Arcularius, Lewis, 121 E. 25th St., New York, New York Co. Original.
Armstrong, James A., Clinton, Oneida Co.
Armstrong, S. T., 166 W. 54th St., New York, New York Co.
Arnold, Edmund S. F., 64 Madison Ave., New York, New York Co. Original.
Arnold, Glover C., 115 E. 30th St., New York, New York Co.
Arnold, J. Newton, Clyde, Wayne Co. Founder.
Atwood, H. L., Collins Centre, Erie Co. Original.
Ayer, W. L., Owego, Tioga Co. Original.
Ayres, Douglas. Fort Plain, Montgomery Co. Original.

* Deceased.

Babcock, H. E., New London, Oneida Co. Original.
Backus, Ogden, 67 S. Fitzhugh St., Rochester, Monroe Co. Original.
Bacon, Charles G., Fulton, Oswego Co. (Retired list.)
Bagg, Moses M., Utica, Oneida Co. Original. (Retired list.)
Bailey, Theodore P., 95 Eagle St., Albany, Albany Co. Founder.
Bailey, William C. Original. Knoxville, Tenn.
Baker, Benjamin N., Rhinebeck, Dutchess Co.
Baker, Frank R., 540 Bedford Ave., Brooklyn, E. D., Kings Co.
Baker, George W., 540 Bedford Ave., Brooklyn, E. D., Kings Co. Founder.
Baldwin, F. A., 329 W. 23d St., New York, New York Co.
Banks, George B., Hartsdale, Westchester Co. Original. (Retired list.)
Banta, Rollin L., 330 Elk St., Buffalo, Erie Co. Original.
Barnes, Edwin, Pleasant Plains, Dutchess Co. Original.
Barney, Charles S., Milford, Otsego Co. Original.
Barnum, D. Albert, Cassville, Oneida Co.
Bartlett, Frederick W., 523 Delaware Ave., Buffalo, Erie Co. Original.
Barton, Lyman, Willsborough, Essex Co. Founder. (Retired list.)
Barton, L. G., Willsborough, Essex Co.
Barton, Thomas J., Red Hook, Dutchess Co.
Bates, Nelson W., Central Square, Oswego Co.
Bates, Xyris T., East Chatham, Columbia Co. Original.
Bayley, Guy Carleton, Poughkeepsie, Dutchess Co. Original.
Baynes, Joseph E., 2419 5th Ave., Troy, Rensselaer Co.
Beardsley, William E., 101 Taylor St., Brooklyn, Kings Co.
Beers, John E., Danby, Tompkins Co. Founder.
Bellows, George A., Waterloo, Seneca Co.
Bemus, Morris N., Jamestown, Chautauqua Co.
Bemus, William Marvin, Jamestown, Chautauqua Co.
Benham, John C., Hudson, Columbia Co. Original.
Bennett, Thomas W., Jeffersonville, Sullivan Co. Original.
Bentley, Francis R., Cheshire, Ontario Co. Original. (Retired list.)
Bergtold, W. H., 56 Allen St., Buffalo, Erie Co.
Bermingham, Edward J., 7 W. 45th St., New York, New York Co.
Bierwirth, Julius C., 137 Montague St., Brooklyn, Kings Co.
Biggam, William H., Jr., 1095 Dean St., Brooklyn, Kings Co. Original.
Biggs, Chauncey P., 14 E. Seneca St., Ithaca, Tompkins Co.
Biggs, Hermann M., 5 W. 58th St., New York, New York Co. Original.
Birdsall, Gilbert, North Brookfield, Madison Co. Original.
Bissell, James H., 2187 5th Ave., Troy, Rensselaer Co.
Blaine, Myron D., Willard, Seneca Co.
Blair, Louis P., McDonough, Chenango Co. Original.
Blake, Clarence R., Northville, Fulton Co. Original.
Blumer, G. Alder, State Hospital, Utica, Oneida Co. Original.
Boies, Loren F., 286 Howard Ave., Buffalo, Erie Co. Original.
Bond, G. F. M., State Hospital, Utica, Oneida Co.
Bonesteel, H. F., Mill St., Troy, Rensselaer Co.
Bonesteel, William N., Mill St., Troy, Rensselaer Co. Founder. (Retired list.)

Bontecou, Reed B., 82 4th St., Troy, Rensselaer Co. Original.
Booth, Wilbur H., 172 Genesee St., Utica, Oneida Co. Original.
Boyce, Elias B., Averill Park, Rensselaer Co.
Bozeman, Nathan, 9 W. 31st St., New York, New York Co. Founder.
Bozeman, Nathan G., 9 W. 31st St., New York, New York Co.
Bradford, George D., Homer, Cortland Co.
Bradley, O. Howard, Hudson, Columbia Co.
Brandt, J. S., Ontario Center, Wayne Co.
Briggs, Albert H., 267 Hudson St., Buffalo, Erie Co. Original.
Briggs, William H., Hemlock Lake, Livingston Co. Original.
Brodrick, William P., 164 W. 121st St., New York, New York Co.
Brooks, Leroy J., Norwich, Chenango Co. Original.
Brooks, Mark N., Springville, Erie Co.
Brown, Charles W., 902 14th St., N. W., Washington, D. C. Original.
Brown, George L., 121 Franklin St., Buffalo, Erie Co.
Brown, J. P., Nunda, Livingston Co.
Brown, Ulysses H., 312 Warren St., Syracuse, Onondaga Co.
Brundage, Amos H., 609 Madison St., Brooklyn, Kings Co. Original.
Brush, Edward F., Mount Vernon, Westchester Co. Original.
Brush, Edward N., Shepperd Asylum, Towsen, Md. Original.
Bryant, Joseph D., 54 W. 36th St., New York, New York Co. Original.
Bryant, Percy, State Hospital, Buffalo, Erie Co.
Buchanan, Alexander, 358 W. 30th St., New York, New York Co. Original.
Buckley, James, 127 E. Main St., Rochester, Monroe Co. Original.
Bull, Charles Stedman, 47 W. 36th St., New York, New York Co. Original.
Bull, William T., 35 W. 35th St., New York, New York Co.
Burbeck, Charles H., 91 First St., Troy, Rensselaer Co. Founder.
Burchard, Thomas H., 7 E. 48th St., New York, New York Co. Original.
Burghardt, Francis Augustus, 632 Elm St., Buffalo, Erie Co.
Burhyte, O. W., Brookfield, Madison Co.
Burke, John J. A., 65 East Ave., Rochester, Monroe Co. Original.
Burns, William J., Sea Cliff, Queens Co. Original.
Burton, Henry B., 75 4th St., Troy, Rensselaer Co.
Burton, Matthew H., 75 4th St., Troy, Rensselaer Co. Founder.
Cady, George N., Nichols, Tioga Co.
Cahill, John T., Hoosick Falls, Rensselaer Co.
Caldwell, Nathan A., Hageman's Mills, Montgomery Co.
Campbell, A. J., 332 Warren St., Syracuse, Onondaga Co.
Campbell, Clarence G., 68 W. 35th St., New York, New York Co.
Carpenter, Henry W., Oneida, Madison Co. Original.
Carr, William, 35 W. 46th St., New York, New York Co.
Carter, H. Skelton, 130 E. 24th St., New York, New York Co. Original.
Casey, J. E., Mohawk, Herkimer Co.
Cavana, Martin, Oneida, Madison Co.
Chambers, Jacob, Kingston, Ulster Co. Original.
Chambers, Martin L., Port Jefferson, Suffolk Co. Original.
Chapman, James, Medina, Orleans Co. Founder.

Chauveau, Jean F., 31 W. 60th St., New York, New York Co. Original.
Chittenden, Daniel J., Addison, Steuben Co.
Chittenden, Joseph H., Binghamton, Broome Co. Founder.
Chrystie, T. M. Ludlow, 216 W. 46th St., New York, New York Co. Original.
Church, B. A., Oneonta, Otsego Co.
Church, Charles A., Bloomingdale, Essex Co.
Church, Thomas C., Valley Falls, Rensselaer Co.
Churchill, Alonzo, 189 Genessee St., Utica, Oneida Co. (Retired list.)
Clark, Dewitt C., Marathon, Cortland Co. Original.
Clarke, Wallace, 136 Park Ave., Utica, Oneida Co.
Clendenan, C. W., N. Tonawanda, Erie Co.
Clum, Franklin D., Cheviot, Columbia Co.
Codding, George H., Amenia, Dutchess Co. Founder.
Coffin, Lawrence, 473 Bedford Ave., Brooklyn, Kings Co.
Cohen, Bernard, 497 Niagara St., Buffalo, Erie Co.
Collins, Stacy B., Seaford, Sussex Co., Del.
Colvin, Darwin, Clyde, Wayne Co. Founder.
Comfort, John E., 1315 Franklin Ave., New York, New York Co.
Comstock, George F., Saratoga Springs, Saratoga Co. Founder.
Congdon, Charles E., 1034 Jefferson St., Buffalo, Erie Co.
Conkling, George, Durham, Greene Co. Original.
Conner, Milton C., Middletown, Orange Co.
Conover, William S., 237 W. 132d St., New York, New York Co. Founder.
Conway, John Francis, cor. Buffalo and Union Sts., Brooklyn, Kings Co. Original.
Conway, John R., 130 Lexington Ave., New York, New York Co.
Cook, Guy Reuben, Louisville, St. Lawrence Co.
Cooke, Almon H., 148 E. 18th St., New York, New York Co.
Cooley, F. L., 210 First St., Oswego, Oswego Co.
Cooley, R. N., Hannibal Centre, Oswego Co.
Cooper, William C., 81 3d St., Troy, Rensselaer Co. Original.
Copley, Herman D., Bainbridge, Chenango Co.
Coutant, Richard B., Tarrytown, Westchester Co. Original.
Cramer, William, 136 Mansion St., Poughkeepsie, Dutchess Co. Founder.
Crane, Frank W., Corfu, Genessee Co. Original.
Crawe, J. Mortimer, Watertown, Jefferson Co. Founder.
Creamer, Joseph, Jr., 168 N. 6th St., Brooklyn, E. D., Kings Co.
Criado, Louis F., 147 Fort Green Place, Brooklyn, Kings Co.
Crocker, Edwin, Narrowsburg, Sullivan Co.
Crombie, Walter C., Mechanicsville, Saratoga Co. Original.
Cronyn, John, 55 W. Swan St., Buffalo, Erie Co. Founder.
Crosby, Alexander H., Lowville, Lewis Co.
Crounse, Andrew C., Melrose, Rensselaer Co.
Curry, Walker, 21 E. 61st St., New York, New York Co. Original.
Curtis, Daniel, Jeddo, Orleans Co.
Curtis, D. F., 95 South Ave., Rochester, Monroe Co.
Curtis, P. C., Round Lake, Saratoga Co.

Dagenais, Alphonse, 473 W. Virginia St., Buffalo, Erie Co. Original.
Dallas, Alexander, 65 W. 36th St., New York, New York Co.
Dallas, Alexander J., 48 Warren St., Syracuse, Onondaga Co. Founder.
Dandridge, N. P., 148 Broadway, Cincinnati, Ohio.
Daniels, Clayton M., 868 Main St., Buffalo, Erie Co. Original.
Daniels, F. H., 140 W. 126th St., New York, New York Co.
D'Avignon, Francis J., Au Sable Forks, Essex Co. Original.
Davis, J. Griffith, 200 W. 14th St., New York, New York Co.
Davis, J. O., Howells, Orange Co.
Davis, Robert C., 150 E. 128th St., New York, New York Co.
Dayton, C. L., 246 Dearborn St., Buffalo, Erie Co. (Retired list.)
Dean, Harmon J., Brocton, Chautauqua Co. Founder.
De Garmo, W. B., 56 W. 36th St., New York, New York Co.
DeKay, William H., Parksville, Sullivan Co.
De Laney, John Pope, Geneva, Ontario Co.
Delphey, Eden V., 358 W. 58th St., New York, New York Co.
Dench, Edward B., 17 W. 46th St., New York, New York Co.
Denison, Charles Ellery, 113 W. 12th St., New York, New York Co. Original.
Denison, Ellery, 113 W. 12th St., New York, New York Co. Original.
Dennis, Frederick S., 542 Madison Ave., New York, New York Co. Founder.
De Quesada, Gregorio J., 413 W. 43d St., New York, New York Co.
De Witt, Byron, Oswego, Oswego Co. Original.
De Zouche, Isaac, Gloversville, Fulton Co. Founder.
Dickinson, M. D., Troy, Rensselaer Co.
Dickson, Thomas Gordon, Troy, Rensselaer Co.
Didama, Emory A., Cortland, Cortland Co.
Didama, Henry D., 112 S. Salina St., Syracuse, Onondaga Co. Founder.
Dodge, Amos P., Oneida Castle., Oneida Co.
Dodge, Frank B., Mount Morris, Livingston Co.
Dodge, Lyndhurst C., Rouse's Point, Clinton Co. Founder.
Donohue, Florence, O., 410 Warren St., Syracuse, Onondaga Co. Original.
Dorland, Elias T., 86 N. Division St., Buffalo, Erie Co. Original.
Douglas, George, Oxford, Chenango Co.
Douglass, A. J., Illion, Herkimer Co.
Douglass, Charles E., Lowville, Lewis Co.
Douglass, James W., Boonville, Oneida Co.
Drake, D. Delos, Johnstown, Fulton Co.
Drake, E. G., 312 W. Church St., Elmira, Chemung Co.
Drake, Frank C., Oneida, Madison Co.
Drake, James B., Hancock, Delaware Co.
Drake, W. F., 214 E. 50th St., New York, New York Co.
Du Bois, Matthew B., 66 Broadway, Manhattan Life Ins. Co., New York, New York Co. Original.
Dudley, A. Palmer, 640 Madison Ave., New York, New York Co.
Dudley, Dwight, Maine, Broome Co.
Dunham, Edward K., 338 E. 26th St., New York, New York Co.

Dunlop, John J., Waterford, Saratoga Co. Original.
Dunn, Jeremiah, Bath, Steuben Co. Original.
Dunning, J. D., Webster, Monroe Co. Original.
Earle, George W., Tully, Onondaga Co.
Eastman, Robert W., 170 W. 78th St., New York, New York Co. Original.
Eddy, George P., Lewiston, Niagara Co.
Eddy, John L., Olean, Cattaraugus Co.
Edwards, Amos S., 1506 N. Salina St., Syracuse, Onondaga Co. Original.
Edwards, George A., Catherine and Lodi Sts., Syracuse, Onondaga Co. Original.
Edwards, John, Gloversville, Fulton Co.
Einhorn, Max, 107 E. 65th St., New York, New York Co.
Eldridge, Stuart, Yokohama, Japan. (Non-resident.)
Eliot, Ellsworth, 48 W. 36th St., New York, New York Co. Original.
Ellinwood, A. G., Attica, Wyoming Co. Original.
Ellis, J. B., Whitesborough, Oneida Co.
Ellison, Metler D., Canisteo, Steuben Co. Original.
Ellsworth, Victor A., 41 Waltham St., Boston, Mass.
Ely, Henry Oliver, Binghamton, Broome Co. Original.
Enders, Thomas Burnham, 163 W. 121st St., New York, New York Co.
English, G. P., Booneville, Oneida Co.
Erdmann, John F., 141 W. 34th St., New York, New York Co.
Farnham, LeRoy D., Binghamton, Broome Co.
Farrington, Edward S., 213 W. 31st St., New York, New York County.
Farrington, John M., Binghamton, Broome Co.
Farrington, Joseph O., 1991 Madison Ave., New York, New York Co.
Feeley, James F., 296 Lorimer St., Brooklyn, E. D., Kings Co.
Fell, George E., 72 Niagara St., Buffalo, Erie Co.
Fenno, Henry Marshall, 77 W. Main St., Rochester, Monroe Co.
Ferguson, E. D., 1 Union Place, Troy, Rensselaer Co. Founder.
Ferguson, Frank, 20 W. 38th St., New York, New York Co.
Field, Matthew D., 115 E. 40th St., New York, New York Co.
Finder, William, Jr., 2 Union Place, Troy, Rensselaer Co. Founder.
Fisher, John C., Warsaw, Wyoming Co.
Fitzgerald, David J., Glens Falls, Warren Co.
Fitzgerald, John F., State Custodial Asylum, Rome, Oneida Co.
Flandrau, Thomas M., Rome, Oneida Co.
Flanigan, John R., Syracuse, Onondaga Co.
Fletcher, Charles L., Wing's Station, Dutchess Co. Original.
Flickinger, John, Trumansburg, Tompkins Co.
Flint, Austin, 60 E. 34th St., New York, New York Co. Founder.
Flint, Austin, Jr., 252 Madison Ave., New York, New York Co.
Flint, William H., Ridgefield, Conn. Founder (Retired list.)
Ford, M. L., Oneonta, Otsego Co.
Forker, Frederick L., Binghamton, Broome Co.
Foster, George V., 109 E. 18th St., New York, New York Co.
Fowler, Joseph, 31 Church St., Buffalo, Erie Co.

Frankenberg, Jacob H., 142 E. 74th St., New York, New York Co.
Fraser, Jefferson C., Ava, Qneida Co.
Frazee, A. Blair, Altoona, Pa.
Frederick, Carlton C., 64 Richmond Ave., Buffalo, Erie Co.
French, S. H., Amsterdam, Montgomery Co.
Fridenberg, Edward, 2019 Fifth Ave., New York, New York Co.
Fritts, Crawford Ellsworth, Hudson, Columbia Co.
Fuller, Earl D., 66 Varick St., Utica, Oneida Co.
*Fuller, Robert, Schenectady, Schenectady Co.
Furman, Guido, 107 W. 85th St., New York, New York Co. Original.
Furman, J. Henry, Tarrytown, Westchester Co. Original.
Gardner, W. F., 175 6th Ave., Brooklyn, Kings Co.
Garlock, William D., Little Falls, Herkimer Co.
Getty, A. H., Athens, Greene Co.
Gibson, William M., 187 Genesee St., Utica, Oneida Co.
Gilbert, Horatio, Hornellsville, Steuben Co.
Gillis, William, Fort Covington, Franklin Co. Founder.
Gleitsmann, J. W., 46 E. 25th St., New York, New York Co.
Glidden, Charles H., Little Falls, Herkimer Co. Original.
*Goldthwaite, Henry, Fifth Avenue Hotel, New York, New York Co.
Goler, George W., 54 S. Fitzhugh St., Rochester, Monroe Co.
Gould, Cassius W., 1428 Maine St., Buffalo, Erie Co.
Gouley, John W. S., 11 E. 43d St. New York, New York Co. Founder.
*Govan, William, Stony Point, Rockland Co. Founder.
Gow, Frank F., Schuylerville, Saratoga Co.
Granger, William D., Bronxville (Vernon House), Westchester Co.
Grant, Charles S., Saratoga Springs, Saratoga Co. Founder.
Grauer, Frank, 326 W. 46th St., New York, New York Co.
Graves, Ezra, Amsterdam, Montgomery Co. Original.
Gray, Joseph F., 326 W. 31st St., New York, New York Co.
Green, H. H., Paine's Hollow, Herkimer, Co.
Green, Stephen S. 426 Niagara St., Buffalo, Erie Co.
Greene, Clark W., Chenango Forks, Broome Co.
Greene, Cordelia A., Castile, Wyoming Co.
Greene, DeWitt C., 1125 Main St., Buffalo, Erie Co. Original.
Greene, Joseph C., 124 Swan St., Buffalo, Erie Co. Founder.
Greene, Walter D., 444 Elk St., Buffalo, Erie Co. Original.
Greenman, C. E., 575 1st St., Troy, Rensselaer Co.
Gulick, A. Reading, 726 Broadway, New York, New York Co.
Gulick, Charlton R., Broadway (Central Hotel), New York, New York Co.
Guy, J. D., Chenango Forks, Broome Co.
Hagadorn, William, Gilboa, Schoharie Co. Original.
Halbert, M. L., Cincinnatus, Cortland Co.
Hall, William H., Saratoga Springs, Saratoga Co. Original.
Hamill, Edward H., 302 6th Ave., Newwark, N. J.
Hammer, Charles, Schenectady, Schenectady Co.

* Deceased.

Hammond, Frederick Porter, 143 E. 117th St., New York, New York Co.
Hand, S. M., Norwich, Chenango Co.
Hannan, James C., Hoosick Falls, Rensselaer Co. Founder.
Hannan, Thomas H., Hoosick Falls, Rensselaer Co.
Harrington, D. W., 1430 Main St., Buffalo, Erie Co. Original.
Harrison, George Tucker, 221 W. 23d St., New York, New York Co. Original.
Hartwig, Marcell, 34 E. Huron St., Buffalo, Erie Co.
Harvie, J. B., 6 Clinton Place, Troy, Rensselaer Co. Founder.
Hatch, C. A., 10 E. Onondaga St., Syracuse, Onondaga Co. Original.
Haubold, H. A., 225 E. 72d St., New York, New York Co.
Hayd, Herman E., 78 Niagara St., Buffalo, Erie Co.
Hayes, Philetus A., Afton, Chenango Co.
Haynes, John U., 103 Mohawk St., Cohoes, Albany Co.
Head, Adelbert D., 202 E. Genesee St., Syracuse, Onondaga Co. Founder.
Heath, William H., 415 Pearl St., Buffalo, Erie Co.
Heimstreet, Thomas B., 14 Division St., Troy, Rensselaer Co. Original.
Hendrick, Henry C., McGrawville, Cortland Co. Founder.
Hepburn, Neil J., 369 W. 23d St., New York, New York Co.
Hewitt, Adelbert, Saratoga Springs, Saratoga Co.
Hicks, Edward E., 923 Jefferson Ave., Brooklyn, Kings Co.
Hicks, W. Scott, Bristol, Ontario Co. Original.
Higgins, F. W., Cortland, Cortland Co.
Hillis, Thomas J., 51 Charlton St., New York, New York Co.
Hills, Lyman H., Binghamton, Broome Co. Original.
Himmelsbach, George A., 30 12th St., Buffalo, Erie Co.
Hinton, John H., 41 W. 32d St., New York, New York Co. Founder.
Hodgman, Abbott, 141 E. 38th St., New York, New York Co. Founder.
Hodgman, William H., 103 Caroline St., Saratoga Springs, Saratoga Co. Founder.
*Hogan, M. K., 226 W. 34th St., New York, New York Co.
Holcomb, O. A., Plattsburgh, Clinton Co.
Holden, Arthur L., 116 South St., Utica, Oneida Co.
Holmes, Martha C., 75 W. 126th St., New York, New York Co.
HoornBeek, Philip Du Bois, Wawarsing, Ulster Co. Original. (Retired list.)
Horton, David B., Red Creek, Wayne Co.
Hough, F. P., Binghamton, Broome Co.
Houston, David W., 44 2d St., Troy, Rensselaer Co. Original.
Hovey, B. L., 34 N. Fitzhugh St., Rochester, Monroe Co. Founder.
Howard, Charles F., 1458 Main St., Buffalo, Erie Co,
Howland, George T., Poughkeepsie, Dutchess Co.
Hoyer, F. F., Tonawanda, Erie Co. Founder.
Hubbard, Chauncey G., Hornellsville, Steuben Co.
Hubbard, Dwight L., 117 W. 93d St., New York, New York Co.
*Hubbard, George E., 257 W. 52d St., New York, New York Co.

*Deceased.

*Hubbard, Samuel T., 27 W. 9th St., New York, New York Co. Founder.
Hubbell, Alvin A., 212 Franklin St., Buffalo, Erie Co.
Hudson, George, Stillwater, Saratoga Co.
Huestis, W. B., Kiskatom, Greene Co.
Huggins, William Q., Sanborn, Niagara Co.
Hughes, Henry R., Clinton, Oneida Co.
Hughes, Peter, 275 Berry St., Brooklyn, Kings Co.
Hulette, G. S., Arcade, Wyoming Co.
Hühne, August, Rondout, Ulster Co. Founder.
Hühne, Frederick, Rondout, Ulster Co. Original.
Hull, Thomas H., 55 Lee Ave., Brooklyn, Kings Co.
*Hull, William H., Poestenkill, Rensselaer Co.
Hulse, William A., Bay Shore, Suffolk Co.
Humphrey, J. F., Saratoga Springs, Saratoga Co.
Hunt, H. L., Orchard Park, Erie Co.
Hunt, James G., 5 Gardner Block, Utica, Oneida Co. Original.
Hunter, Nathaniel P., Jasper, Steuben Co.
Huntington, Henry K., New Rochelle, Westchester Co. Original.
Huntington, John W., Mexico, Oswego Co.
Huntley, James F., Oneida, Madison Co.
Hutton, M. B., Valley Falls, Rensselaer Co.
Ilgen, Ernst, 369 Herkimer St., Brooklyn, Kings Co. Original. (Retired list.)
Ingraham, Henry D., 405 Franklin St., Buffalo, Erie Co.
Ingraham Samuel, Palmyra, Wayne Co. Original. (Retired list.)
Inlay, Erwin G., Saratoga Springs, Saratoga Co.
Jackson, Albert P., Oakfield, Genesee Co. Founder.
Jackson, Charles W., 168 W. 81st St., New York, New York Co.
Jackson, William H., Springville, Erie Co.
Jacobson, Nathan, 430 S. Salina St., Syracuse, Onondaga Co. Original.
Jamison, John S., Hornellsville, Steuben Co. Original.
Janeway, Edward G., 36 W. 40th St., New York, New York Co. Founder.
Janvrin, J. E., 191 Madison Ave., New York, New York Co.
Jenkins, John A., 271 Jefferson Ave., Brooklyn, E. D., Kings Co. Original.
Jenkins, William T., 109 E. 26th St., New York, New York Co.
Jewett, F. A., 282 Hancock St., Brooklyn, Kings Co.
Jewett, Homer O., Cortland, Cortland Co. Founder.
Johnson, George P., Mexico, Oswego Co.
Johnson, Ianthus G., Greenfield Centre, Saratoga Co. Original.
Johnson, Leonard M., Greene, Chenango Co. Original.
Johnson, Parley H., Adams, Jefferson Co. Original.
Johnson, Richard G., Amsterdam, Montgomery Co. Original.
Johnson, Thomas M., 418 Main St., Buffalo, Erie Co. Original.
Johnston, Henry C., New Brighton, Richmond Co.
Johnston, N. B., Barryville, Sullivan Co.
Jones, Allen A., 436 Franklin St., Buffalo, Erie Co.

*Deceased.

Jones, George H., Fowlerville, Livingston Co.
Jones, S. Case, 21 East Ave., Rochester, Monroe Co.
Joslin, Albert A., Martinsburgh, Lewis Co.
Judson, A. B., 25 Madison Ave., New York, New York Co.
Julian, John M., Pleasant Valley, Dutchess Co.
Keefer, Charles W., Mechanicsville, Saratoga Co.
Keith, Halbert Lyon, Upton, Mass.
Kelley, John Devin, Lowville, Lewis Co.
Kemp, William M., 267 W. 23d St., New York, New York Co.
Kenyon, Benjamin, Cincinnatus, Cortland Co.
Kenyon, M., King's Ferry, Cayuga Co. Original.
King, Ferdinand, 315 W. 58th St., New York, New York Co.
King, James K., Watkins, Schuyler Co.
Kingsley, Henry F., Schoharie, Schoharie Co. Original.
Kittridge, Charles M., Fishkill-on-Hudson, Dutchess Co. Founder.
Klock, Charles M., St. Johnsville, Montgomery, Co.
Knapp, W. H., Binghamton, Broome Co.
Kneeland, B. T. Dalton, Livingston, Co.
Kneeland, Jonathan S., Onondaga, Onondaga Co. Founder. (Retired list.)
Kneer, F. G., 236 W. 51st St., New York, New York Co.
Knipe, George, 353 W. 24th St., New York, New York Co.
Kniskern, A. C., Mechanicsville, Saratoga Co.
Kuhn, William, Rome, Oneida Co.
LaBell, Martin J., Lewis, Essex Co. Original.
Laird, William R., 98 Wall St., Auburn, Cayuga Co. Original.
Lake, Albert D., Gowanda, Cattaraugus Co.
Lambert, John, Salem, Washington Co.
Landon, Newell E., Newark, Wayne Co. Original.
Lapp, Henry, Clarence, Erie Co.
Leach, H. M., Charlton City, Massachusetts. Original.
Leale, Charles A., 604 Madison Ave., New York, New York Co. Founder.
Leaning, John K., Cooperstown, Otsego Co. Founder.
Leffingwell, E. D., Watkins, Schuyler Co.
Leighton, N. W., 143 Taylor St., Brooklyn, E. D., Kings Co. Original.
Le Roy, Irving D., Pleasant Valley, Dutchess Co. Founder.
Lester, Elias, Seneca Falls, Seneca Co. Founder.
Lewis, Robert, 19 E. 38th St., New York, New York Co.
Lindsay, Walter, Huntington, Suffolk Co. Original.
Little, Albert H., 230 W. 43d St., New York, New York Co.
Little, Frank, 114 Montague St. Brooklyn, Kings Co.
Lloyd, T. Mortimer, 125 Pierrepont St., Brooklyn, Kings Co. Original.
Lockwood, Charles E., 34 W. 38th St., New York, New York Co.
Lockwood, J. W., Philmont, Columbia Co. Original.
Long, Alfred J., Whitehall, Washington Co.
Long, Ben G., 1408 Main St., Buffalo, Erie Co.
Ludlow, Ogden C., 2309 7th Ave.,New York, New York Co.
Lukens, Anna, 1068 Lexington Ave., New York, New York Co.

Lung, Jesse B., 382 Marion St., Brooklyn, Kings Co. Original.
Lusk, William T., 47 E. 34th St., New York, New York Co. Founder.
Lusk, Zera J., Warsaw, Wyoming Co.
Lyman, H. C., Sherburne, Chenango Co. Original.
Lynch, Patrick J., 216 E. 13th St., New York, New York Co.
Lyon, E. M., Plattsburgh, Clinton Co. Founder.
Lyon, George E., Planter's Hotel, St. Louis, Mo. Original.
Lyons, Edward L., 298 4th St., Troy, Rensselaer Co.
Lyons, G. A., New Rochelle, Westchester Co. Original.
Macfarlane, William A., Springville, Erie Co.
MacGregor, James R., 1118 Madison Ave., New York, New York Co.
Mackenzie, J. C., 432 W. 22d St., New York, New York Co.
Maclean, Donald, 652 Mission St., Detroit, Mich. (Non-resident.)
Magee, Charles M., 800 South West St., Syracuse, Onondaga Co.
Magee, Daniel, 608 Federal St., Troy, Rensselaer Co. Original.
Maher, J. J. E., 213 W. 23d St., New York, New York Co.
Maine, Alvah P., Webster, Monroe Co.
Manley, Thomas H., 115 W. 49th St., New York, New York Co. Founder.
Marsh, E. Frank, Fulton, Oswego Co.
Marsh, James P., 1739 5th Ave., Troy, Rensselaer Co.
Marshall, Francis F., 56 W. 56th St., New York, New York Co.
Martin, John H., Otego, Otsego Co. Original.
Martindale, F. E., Port Richmond, Richmond Co.
Martine, Godfrey R., Glens Falls, Warren Co. Original.
McAlpin, D. Hunter, 40 W. 40th St., New York, New York Co.
McBurney, Charles, 28 W. 37th St., New York, New York Co.
McCollom, William, 195 Lefferts Place, Brooklyn, Kings Co. Original.
McDaniel, Alfred C., San Antonio, Texas. (Non-resident.
McDonald, George E., Schenectady, Schenectady Co. Original.
McDougall, R. A., Duanesburg, Schenectady Co.
McDougall, William D., Spencerport, Monroe Co. (San José, Cal.)
McGann, Thomas, Wells, Hamilton Co.
McGillicuddy, T. J., 776 Madison Ave., New York, New York Co.
McGowen, John P., 137 E. 28th St., New York, New York Co.
McIlroy, Samuel H., 330 Alexander Ave., New York, New York Co.
McLeod, Johnston, 247 W. 23d St., New York, New York Co.
McLeod, S. B. Wylie, 247 W. 23d St., New York, New York Co. Founder.
McLochlin, James A., 157 W. 21st St., New York, New York Co. Original.
McNamara, Daniel, 243 W. Genessee St., Syracuse, Onondaga Co. Original.
McNamara, Laurence J., 126 Washington Place (West), New York, New York Co. Original.
McNicholl, Thomas A., 321 E. 50th St., New York, New York Co.
McWilliams, F. A., Monticello, Sullivan Co.
Meacham, Isaac D., Binghamton, Broome Co.
Meier, Gottlieb C. H., 126 E. 58th St., New York, New York Co.
Menzie, R. J., Caledonia, Livingston Co. Original.
Merritt, George, Cherry Valley, Otsego Co. Original.
Meyer, George L., Stone Arabia, Montgomery Co.

Milbury, Frank S., 215 Jefferson Ave., Brooklyn, Kings Co.
Miles, George W., Oneida, Madison Co.
Miller, William T., 310 W. 27th St., New York, New York Co. Original.
Milliken, S. E., 36 W. 59th St., New York, New York Co.
Minard, E. J. Chapin, 243 Quincy St., Brooklyn, Kings Co. Original.
Miranda, Ramon L., 349 W. 46th St., New York, New York Co. Original.
*Mitchell, Howard E., 3 Clinton place, Troy, Rensselaer Co. Founder.
Mitchell, Hubbard W., 747 Madison Ave., New York, New York Co. Original.
Montgomery, J. J., Luzerne, Warren Co.
Moore, Edward M., 74 S. Fitzhugh St., Rochester, Monroe Co. Founder.
Moore, Edward M., Jr., 74 S. Fitzhugh St., Rochester, Monroe Co. Original.
Moore, Richard Mott, 74 S. Fitzhugh St., Rochester, Monroe Co. Original.
Moore, William A., Binghamton, Broome Co.
Moran, James, 352 W. 51st. St., New York, New York Co.
Morehouse, E. W., 199 2d St. Troy, Rensselaer Co.
Moriarta, Douglas C., Saratoga Springs, Saratoga Co.
Morrow, William B., Walton, Delaware Co.
Mott, Valentine, 62 Madison Ave., New York, New York Co.
Moyer, Frank H., Moscow, Livingston Co. Original.
Mudge, Selden J., Olean, Cattaraugus Co.
Munger, Charles, Knoxborough, Oneida Co.
Munson, J. A., Woodbourne, Sullivan Co. Original.
Munson, W. W., Otisco, Onondaga Co. Original.
Murdoch, James Bissett, 4232 5th Ave,. Pittsburgh, Pa. (Non-resident.)
Murdock, George W., Cold Spring, Putnam Co. Founder.
Murphy, John, 249 E. 35th St, New York, New York Co. Original.
Murray, Byron J., Saratoga Springs, Saratoga Co. Original.
Murray, S. J., 133 W. 87th St., New York, New York Co. Original.
Murray, William D., Tonawanda, Erie Co. Original.
Nelson, William H., Taberg, Oneida Co.
Newman, George W., 234 Leonard St., Brooklyn, Kings Co.
Newman, Robert, 68 W. 36th St., New York, New York Co. Original.
Nichols, Calvin E., 25 1st St., Troy, Rensselaer Co. Founder.
Nichols, H. W., Canandaigua, Ontario Co. Founder. (Retired list.)
Nichols, William H., West Sand Lake, Rensselaer Co. Founder.
Nicholson, A. R., Madison, Madison Co. Original.
Nicoll, Henry D., 51 E. 57th St., New York, New York Co. Founder.
Nold, John B., Utica, Oneida Co. (Retired list.)
North, Nelson L., 627 Bedford Ave., Brooklyn, Kings Co. Original.
Noyes, James B., New Berlin, Chenango Co.
Nutten, Wilbur F., Newark, Wayne Co.
Obendorfer, Isidor P., 1037 Lexington Ave., New York, New York Co. Original.
O'Brien, Frederick Wm., 1 W. 115th St., New York, New York Co.
O'Brien, M. Christopher, 161 W. 122d St., New York, New York Co.

*Deceased.

Ochs, Benjamin F., 773 Lexington Ave., New York, New York Co.
O'Hare, Thomas A., 157 State St., Rochester, Monroe Co. Original.
Oliver, William, Penn Yan, Yates Co.
O'Meagher, William, 427 E. 84th St., New York, New York Co.
Oppenheimer, H. S., 49 E. 23d St., New York, New York Co.
Oppenheimer, S., 55 E. 65th St. (The Palacio), New York, New York Co.
Orton, John G., Binghamton, Broome Co.
Ostrander, George A., 61 Greene Ave., Brooklyn, Kings Co.
Packer, Thurston G., Smyrna, Chenango Co.
Page, Emmett D., 297 De Kalb Ave., Brooklyn, Kings Co.
Paine, Arthur R., 99 Lafayette Ave., Brooklyn, Kings Co. Original.
Painter, Henry McM., 600 Madison Ave., New York, New York Co.
Palmer, Edmund J., 1342 Lexington Ave., New York, New York Co.
Palmer, F. A., Mechanicsville, Saratoga Co.
Palmer, George M., Warsaw, Wyoming Co. Original.
Palmer, Henry C., cor. Genesee and Hopper Sts., Utica, Oneida Co.
Palmer, Walter B., 30 South St., Utica, Oneida Co.
Parent, J. S., Birchton, Saratoga Co.
Park, Roswell, 510 Delaware Ave., Buffalo, Erie Co.
Park, William Hallock, 128 W. 11th St., New York, New York Co.
Parker, Ransom J., 224 W. 11th St., New York, New York Co.
Parr, John, Buel, Montgomery Co.
Parsons, Israel, Marcellus, Onondaga Co. Founder.
Parsons, John, Kingsbridge, New York, New York Co. Original.
Parsons, W. W. D., Fultonville, Montgomery Co.
Pease, Joseph, Hamlin, Monroe Co. Original.
Perry, John Gardner, 48 E. 34th St., New York, New York Co.
*Perry, Nathaniel M., Troupsburgh, Steuben Co. Original.
Peters, Samuel, 86 Mohawk St., Cohoes, Albany Co. Founder.
Pettit, John A., 519 Swan St., Buffalo, Erie Co. Original.
Phelan, M. Francis, 25 Thirteenth St., Troy, Rensselaer Co.
Phelps, Charles, 34 W. 37th St., New York, New York Co.
Phelps, George G., 239 Blandina St,, Utica, Oneida Co.
Phelps, William C., 146 Allen St., Buffalo, Erie Co.
Pierce, Edward A., Binghamton, Broome Co.
Pierson, George E., Kirkwood, Broome Co. (Retired list.)
Pilgrim, Charles W., State Hospital, Poughkeepsie, Dutchess Co. Original.
Piper, Charles W., Wurtsborough, Sullivan Co.
Place, John F., Jr., Binghamton, Broome Co.
Pohlman, Julius, 539 Niagara St., Buffalo, Erie Co.
Pooler, Hiram A., 34 Gramercy Park, New York, New York Co. Original. (Retired list.)

* Deceased.

Porteous, James G., Poughkeepsie, Dutchess Co. Founder.
Porter, Harry N., 1910 Harewood Ave., Washington, D. C. Founder. (Retired list.)
Porter, P. Brynberg, 8 W. 35th St., New York, New York Co. Original.
Potter, E. Styles, 239 W. 21st St., New York, New York Co.
Potter, Vaughn C., Starkville, Herkimer Co. Original.
Potts, E., Port Jervis, Orange Co.
Pratt, Frank R., Manchester, Ontario Co.
Pray, S. R., 523 Bedford Ave., Brooklyn, Kings Co. Original.
Preston, John R., Schuylerville, Saratoga Co. Original.
Price, Henry R., 485 Franklin Ave., Brooklyn, Kings Co.
Prince, Alpheus, Byron, Genesee Co.
Pritchard, R. L., 72 W. 49th St., New York, New York Co.
Pryor, William R., 15 Park Ave., New York, New York Co.
Pultz, Monroe T., Standfordville, Dutchess Co. Founder.
Purple, Samuel S., 36 W. 22d St., New York, New York Co. Founder.
Putnam, Frederick W., Binghamton, Broome Co. Founder.
Quin, Hamilton S., 171 Genesee St., Utica, Oneida Co.
Race, W. F., 115 W. 25th St., Kearney, Neb. Original.
Rae, Robert, Portageville, Wyoming Co. Original.
Ransom, H. B. (in care S. V. White & Co.), 36 Wall St., New York, New York Co.
Rau, Leonard S., 72 W. 55th St., New York, New York Co.
Rave, Edward G., Hicksville, Queens Co. Original.
Raynor, F. C., 163 Clinton St., Brooklyn, Kings Co.
Read, Ira B., 2074 Fifth Ave., New York, New York Co.
Reagles, James, Schenectady, Schenectady Co. Original.
Reed, Henry B., 12 Verona Place, Brooklyn, Kings Co.
Reese, Frank D., Cortland, Cortland Co.
Reid, Christopher C., Rome, Oneida Co.
Reitz, Charles, Webster, Monroe Co.
Reynolds, Tabor B., Saratoga Springs, Saratoga Co. Founder.
*Rice, George, Mechanicsville, Saratoga Co.
Richards, Charles B., Binghamton, Broome Co. Founder.
Richardson, John E., 127 S. Oxford St., Brooklyn, Kings Co.
Richmond, Nelson G., Fredonia, Chautauqua Co.
Ricketts, Benjamin M., 137 Broadway, Cincinnati, Ohio. Original.
Riley, Andrew W., 207 S. 16th St., Omaha, Neb. Original.
Risch, Henry F. W., 521 3d St., Brooklyn, Kings Co.
Robb, William H., Amsterdam, Montgomery Co. Founder.
Robinson, Ezra A., Geneva, De Kalb Co., Ill. Original.
Rochester, DeLancey, 469 Franklin St., Buffalo, Erie Co.
Rochester, Thomas M., 326 De Kalb Ave., Brooklyn, Kings Co.

*Deceased.

Rodgers, Harris C., 1 Wall St., Binghamton, Broome Co.
Rogers, S. Frank, 3161 6th Ave., Troy, Rensselaer Co. Original.
Rolph, R. T., Fredonia, Chautauqua Co.
Roper, P. B., Alpine, Schuyler Co.
Ross, Frank W., 251 Baldwin St., Elmira, Chemung Co. Original.
Roth, Julius A., 308 E. 79th St., New York, New York Co.
Rousseau, Zotique, 99 2d St., Troy, Rensselaer Co. Founder.
Rudgers, Denton W., Hornellsville, Steuben Co.
Ruggles, Augustus D., 2061 Madison Ave., New York, New York Co.
Rulison, L. B., West Troy, Albany Co.
Rushmore, John D., 129 Montague St., Brooklyn, Kings Co. Founder.
Russell, Charles P., 198 Genesee St., Utica, Oneida Co.
Russell, William G., 27 McDonough St., Brooklyn, Kings Co. Original.
Sabal, E. T., 45 W. Monroe St., Jacksonville, Fla. (Non-resident.)
Sabin, William B., 1425 Broadway, West Troy, Albany Co. Founder.
Sabine, Gustavus A., 8 E. 24th St., New York, New York Co. Original.
Sanders, E., 126 E. 82d St., New York, New York Co.
Sawyer, Conant, Auburn, Cayuga Co. Founder.
Saxer, Leonard A., 514 Prospect Ave., Syracuse, Onondaga Co. Original.
Sayre, Lewis A., 285 5th Ave., New York, New York Co. Founder.
Sayre, Reginald H., 285 5th Ave., New York, New York Co.
Schmid, H. Ernst, White Plains, Westchester Co. Original.
Schopp, Justin H., 127 E. Main St., Rochester, Monroe Co.
Scully, Thomas P., Rome, Oneida Co.
Seaman, Louis L., 18 W. 31st St., New York, New York Co.
Seaman, Frank G., Seneca Falls, Seneca Co.
Sears, F. W., 326 Montgomery St., Syracuse, Onondaga Co.
Segur, Avery, 281 Henry St., Brooklyn, Kings Co. Founder. (Retired list.)
Selden, O. G., Catskill, Greene Co. Original.
Selden, Robert, Catskill, Greene Co. Original.
Seymour, Ralph A., Whitney's Point, Broome Co.
Seymour, W. Watkins, 105 3d St., Troy, Rensselaer Co. Founder.
Sharer, John P., Little Falls, Herkimer Co. Original.
Shaw, Henry B., 21 E. 127th St., New York, New York Co.
Shea, Dennis L., 116 Waverly Place, New York, New York Co.
Shepard, A. Warner, 126 Willoughby St., Brooklyn, Kings Co. Original.
Sherer, John D., Waterford, Saratoga Co. Original.
Sherman, F. J., Ballston, Saratoga Co.
Shrady, John, 149 W. 126th St., New York, New York Co.
Shrady, John Eliot, 149 W. 126th St., New York, New York Co.
Shunk, Albert, 232 W. 22d St., New York, New York Co.
Silver, Henry M., 105 W. 72d St., New York, New York Co.

Simmons, Charles E., 762 Madison Ave., New York, New York Co.
Simmons, E. W., Canandaigua, Ontario Co. Founder. (Retired list.)
Simons, Frank E., Canajoharie, Montgomery Co.
Sizer, Nelson Buell, 336 Green Ave., Brooklyn, Kings Co. Original.
Skinner, Smith A., Hoosick Falls, Rensselaer Co. Original.
Slater, Frank Ellsworth, Binghamton, Broome Co.
Small, John W., New Rochelle, Westchester Co.
Smeallie, James A., 12 W. 40th St., New York, New York Co.
Smelzer, Baxter T., Havana, Schuyler Co.
Smith, Alexander A., 40 W. 47th St., New York, New York Co.
Smith, F. A., Corinth, Saratoga Co.
Smith, George C., Delhi, Delaware Co.
Smith, H. Lyle, Hudson, Columbia Co. Original.
Smith, J. Lewis, 64 W. 56th St., New York, New York Co. Original.
Smith, Samuel L., Smithville Flats, Chenango Co.
Smith, Samuel W., 24 W. 30th St., New York, New York Co. Original.
Smith, Stephen, 574 Madison Ave., New York, New York Co. Original.
Smyth, Arthur V. H., Amsterdam, Montgomery Co.
Snook, George M., Parma, Monroe Co.
Southworth, Malek A., 524 13th St., Oakland, Cal. Original.
Southworth, Richmond Joseph, 1220 36th St., N. W., Washington, D. C. Original. (Retired list.)
Spicer, Walter E., 62 Charlton St., New York, New York Co.
Sprague, John A., Williamson, Wayne Co. Original.
Sprague, L. S., Williamson, Wayne Co. (Retired list.)
Squibb, Edward H., 148 Columbia Heights, Brooklyn, Kings Co. Founder. (P. O. Box 760.)
Squibb, Edward R., 152 Columbia Heights, Brooklyn, Kings Co. Founder.
Squire, Charles L., 409 E. Church St., Elmira, Chemung Co.
Steinke, Carl Otho Hermann, 220 17th St., Brooklyn, Kings Co. Original.
Stewart, F. E., West Broadway and Franklin St., New York, New York Co.
St. John, David, Havensack, N. J. (Non-resident.)
Stockschlaeder, P., 186 South Ave., Rochester, Monroe Co.
Stockton, Charles G., 436 Franklin St., Buffalo, Erie Co.
Stone, Frank L., LeRoy, Genesee Co.
Strong, Cyrus J., 49 W. 35th St., New York, New York Co.
Strong, Orville C., Colden, Erie Co.
Strong, Thomas D., Westfield, Chautauqua Co. Founder.
Stubbs, Roland H., Waterford, Saratoga Co. Original.
Sullivan, John D., 74 McDonough St., Brooklyn, Kings Co.
Sutton, H. C., Rome, Oneida Co.
Sutton, Richard E., Rome, Oneida Co.
Swan, William E., Saratoga Springs, Saratoga Co.

Swanick, A. A., Saratoga Springs, Saratoga Co.
Swartwout, H. B., Port Jervis, Orange Co.
Swartwout, Leander, Prospect, Oneida Co.
Sweet, Joseph J., Unadilla, Otsego Co. Original.
Sweet, Joshua J., Unadilla, Otsego Co.
Sweetman, J. T., Jr., Ballston, Saratoga Co.
Syms, Parker, 60 W. 47th St., New York, New York Co.
Taber, R. C., Tonawanda, Erie Co.
Taylor, John H., Holley, Orleans Co. Original.
Tefft, Charles B., Room 20, Arcade, Utica, Oneida Co.
Thomas, T. Gaillard, 600 Madison Ave., New York, New York Co. Founder.
Thompson, R. A., Norwich, Chenango Co.
Thompson, Amos W., Saratoga Springs, Saratoga Co.
Thompson, Von Beverhout, 111 W. 43d St., New York, New York Co.
Thornton, William H., 572 Niagara St., Buffalo, Erie Co.
Thwing, Clarence, Ft. Wrangel, Alaska.
Tiemann, Paul E., 180 W. 94th St., New York, New York Co.
Todd, John B., Parish, Oswego Co.
Tompkins, Fred J., 128 2d Ave., Lansingburgh, Rensselaer Co.
Tompkins, H. C., Knowlesville, Orleans Co. Founder. (Retired list.)
Tompkins, Orren A., East Randolph, Cattaraugus Co. Original.
Townsend, Charles E., Broadway and Grand Sts., Newburgh, Orange Co.
Townsend, Morris W., Bergen, Genesee Co. Founder.
Traver, Richard D., 14 4th St., Troy, Rensselaer Co. Original.
Travis, Edward M., Eagle Grove, Iowa.
Tremaine, Wm. S., 217 Franklin St., Buffalo, Erie Co. Founder.
Tripp, John D., Auburn, Cayuga Co. Original.
Truax, J. G., 17 E. 127th St., New York, New York Co.
Trull, H. P., Williamsville, Erie Co.
Tucker, Carlos P., 43 W. 26th St., New York, New York Co. Founder.
Turner, Melvin H., Mineville, Essex Co. Original.
Twohey, John J., 170 E. Utica St., Buffalo, Erie Co.
Vanderhoof, Frederick D., Phelps, Ontario Co. Original.
Vanderveer, J. C., Monroe, Orange Co.
Vanderveer, J. R., Monroe, Orange Co.
Van de Warker, Ely, 404 Fayette Park, Syracuse, Onondaga Co. Founder.
Van Etten, Cornelius, Rhinebeck, Dutchess Co.
Van Fleet, Frank, 116 E. 82d St., New York, New York Co.
Van Hoevenberg, Henry, Kingston, Ulster Co. Original.
Van Vranken, Adam T., 1603 3d Ave., West Troy, Albany Co. Original.
Van Wagner, L. A., Sherburne, Chenango Co.
Van Wyck, Richard C., Hopewell Junction, Dutchess Co. Original.
Van Zandt, Henry C., Schenectady, Schenectady Co. Original.

Varney, Miles E., Saratoga Springs, Saratoga Co.
Vedder, George W., Philmont, Columbia Co.
Veeder, Andrew T., 93 Fifth Ave., Pittsburgh, Pa.
Von Dönhoff, Edward, 210 W. 4th St., New York, New York Co.
Vincent, Ludger C., 350 W. 58th St., New York, New York Co.
Wagner, Charles Gray, State Hospital, Binghamton, Broome Co.
Wakely, Benjamin C., Angelica, Alleghany Co. Original.
Wales, Theron A., Elmira, Chemung Co. Original.
Wall, Charles A., 306 Hudson St., Buffalo, Erie Co.
Wallace, Edwin E., Jasper, Steuben Co.
Wallach, Joseph G., 7 W. 82d St., New York, New York Co. Original.
Walser, William C., West New Brighton, Richmond Co.
Walsh, Simon J., 25 E. 128th St., New York, New York Co.
Ward, Charles S., 30 W. 33d St., New York, New York Co. Founder.
Ward, John J., Ellenville, Ulster Co.
Ward, R. H., 53 4th St., Troy, Rensselaer Co.
Warner, Frederic M., 66 W. 56th St., New York, New York Co.
Warner, John W., 107 E. 72d St., New York Co.
Waterworth, William, 3 Hancock St., Brooklyn, Kings Co.
Webster, W. B., Schuylerville, Saratoga Co.
Weeks, John E., 154 Madison Ave., New York, New York Co.
Welles, S. R., Waterloo; Seneca Co. (Retired list.)
Wells, E. H., Binghamton, Broome Co.
Wells, William L., New Rochelle, Westchester Co. Original.
West, Joseph E., 171 Genesee St., Utica, Oneida Co.
Weston, Albert T., 226 Central Park West, bet. 82d and 83d Sts., New York, New York Co.
Wheeler, Isaac G., Marilla, Erie Co.
Wheeler, John T., Chatham, Columbia Co.
Whipple, Electa B., 491 Porter Ave., Buffalo, Erie Co.
White, Charles B., 107 W. 72d St., New York, New York Co.
White, J. Blake, 1013 Madison Ave., New York, New York Co.
White, Whitman V., 114 E. 85th St., New York, New York Co. Founder.
Whitford, James, Onondaga Valley, Onondaga Co. Original.
Wieber, George, 181 S. 5th St., Brooklyn, Kings Co. Original.
Wiener, Joseph, 1046 5th Ave., New York, New York Co. Founder.
Wiggin, Frederick Holme, 55 W. 36th St., New York, New York Co.
Williams, George O., Greene, Chenango Co.
Williams, Henry Smith, 165 W. 82d St., New York, New York Co.
Williams, William H., 207 17th St., Brooklyn, Kings Co. Original.
Willoughby, M., 1335 Main St., Buffalo, Erie Co.
Wilson, Thomas, Claverack, Columbia Co. Founder.
Whitbeck, Charles E., Cohoes, Albany Co.

Woodend, William E., 1969 Madison Ave., New York, New York Co.
Woodruff, E. Gould, Watkins, Schuyler Co.
Woodruff, R. Allen, Philmont, Columbia Co.
Woodworth, T. Floyd, Kinderhook, Columbia Co.
Wright, Jonathan, 73 Remsen St., Brooklyn, Kings Co.
Wright, Theodore Goodell, Plainville, Hartford Co., Conn. (Non-resident.)
Wyckoff, Cornelius C., 482 Delaware Ave., Buffalo, Erie Co. Founder.
Wyckoff, Richard M., 532 Clinton Ave., Brooklyn, Kings Co. Founder.
Wyeth, John A., 27 E. 38th St., New York, New York Co. Original.
Young, Augustus A., Newark, Wayne Co. Original.
Young, John D., Starkville, Herkimer Co. Original.
Young, William, Cold Spring, Putnam Co. Founder. (Retired list.)
Zeh, Edgar, Waterford, Saratoga Co.
Zeh, Merlin J., 1521 Broadway, West Troy, Albany Co.

Of 164 Founders, 106 remain on the list; of 286 Original Fellows, 212 remain on the list. Total Fellowship, 800.

RETIRED FELLOWS.

Charles G. Bacon, Fulton, Oswego County (1891).
M. M. Bagg, Utica, Oneida County (1891).
George B. Banks, Hartsdale, Westchester County (1892).
Lyman Barton, Willsborough, Essex County (1890).
F. R. Bentley, Cheshire, Ontario County (1891).
William N. Bonesteel, Troy, Rensselaer County (1890).
Alonzo Churchill, Utica, Oneida County (1890).
C. L. Dayton, Buffalo, Erie County (1891).
W. H. Flint, Ridgefield, Conn. (1895).
Philip DuB. HoornBeek, Wawarsing, Ulster County (1891).
Ernst Ilgen, 360 Herkimer St., Brooklyn, Kings County (1895).
Samuel Ingraham, Palmyra, Wayne County (1890).
Jonathan S. Kneeland, Onondaga County (1890).
H. W. Nichols, Canandaigua, Ontario County (1893).
John B. Nold, Utica, Oneida County (1894).
George E. Pierson, Kirkwood, Broome County (1895).
H. A. Pooler, 34 Gramercy Park, New York, New York County (1892).
H. N. Porter, Washington, D. C. (1891).
Avery Segur, 281 Henry St., Brooklyn, Kings County (1893).
E. W. Simmons, Canandaigua, Ontario County (1892).
R. J. Southworth, Washington, D. C. (1894).
L. S. Sprague, Williamson, Wayne County (1891).
H. C. Tompkins, Knowlesville, Orleans County (1893).

S. R. Welles, Waterloo, Seneca County (1894).
William Young, Cold Spring, Putnam County (1891).

NON-RESIDENT FELLOWS.

N. P. Dandridge, 148 Broadway, Cincinnati, Ohio.
Stuart Eldridge, Yokohama, Japan.
Alfred C. McDaniel, San Antonio, Texas.
Donald Maclean, 652 Mission St., Detroit, Mich.
James Bissett Murdoch, 4232 Fifth Ave., Pittsburgh, Pa.
E. T. Sabal, 45 W. Monroe St., Jacksonville, Fla.
David St. John, Hackensack, N. J.
Theodore Goodell Wright, Plainville, Hartford Co., Conn.

HONORARY FELLOWS.

*Sir John Simon, 40 Kensington Square, London, England (1890).

CORRESPONDING FELLOWS.

*William Goodell, 1418 Spruce St., Philadelphia, Penn. (1890).
Henry O. Marcy, 180 Commonwealth Ave., Boston, Mass. (1890).

*Deceased.

DECEASED FELLOWS.

Name.	Age.	County.	Place of Birth.	Date of Death.	Medical College.	Year of Graduation.
Abell, Ira H. (F)[1]	71	Jefferson	Fairfield, Vt.	April 29, 1894.	Vermont Med. Coll.	1844
Adams, John G. (F)	77	New York	New York City	June 19, 1884.	Coll. Phys. and Surg., N. Y.	1830
Allaben, O. M. (O)[2]	83	Delaware	Delaware Co., N. Y.	Nov. 27, 1891.	Woodstock, Vt.	1831
Andrews, John S. (O)	61	Kings	Bristol, Conn.	Jan. 3, 1889.	Univ. City of New York	1849
Andrews, Judson B. (F)	60	Erie	North Haven, Conn.	Aug. 3, 1894.	Yale Med. School	1863
Ashton, Isaiah H.	39	Westchester	Philadelphia, Pa.	Feb. 16, 1889.	University of Pennsylvania	1870
Avery, George W. (F)	61	Chenango	Earlville, N. Y.	Nov. 1, 1888.	Albany Medical College	1850
Ayres, Alexander (F)	74	Montgomery	Oppenheim, N. Y.	Aug. 27, 1886.	Castleton, Vt.	1842
Babcock, Myron N. (F)	73	Saratoga	West Berkshire, Vt.	May 21, 1892.	Vermont Medical College	1842
Ballou, William R.	29	New York	Bath, Me.	March 9, 1893.	Bellevue Hosp. Med. Coll.	1886
Barker, A. M. (O)	37	Erie	Kendall, Orleans Co., N. Y.	Dec. 6, 1887.	University of Buffalo	1877
Bathgate, James (O)	65	New York	New York	March 27, 1891.	Coll. Phys. and Surg., N. Y.	1846
Baynes, William T. (O)	48	Rensselaer	England	Jan. 22, 1892.	Albany Medical College	1871
Bemus, William P.	63	Chautauqua	Chautauqua Co.	Sept. 19, 1890.	Berkshire Medical College	1847
Blakeman, William N. (O)	85	New York	Roxbury, Conn.	Aug. 10, 1890.	Yale	1832
Buckley, Charles (O)	..	Monroe	.....	.....	University of Pennsylvania	1870
Bucklin, Daniel D. (O)	70	Rensselaer	Brunswick, N. Y.	April 19, 1890.	Albany Medical College	1846
Budd, J. Henry (O)	45	Ontario	United States	Feb. 25, 1890.	Buffalo Medical College	1875
Burwell, George N. (O)	72	Erie	Norway, Herkimer Co.	May 15, 1891.	University of Pennsylvania	1843
Carroll, Alfred Ludlow (F)	60	New York	New York City	Oct. 30, 1893.	Univ. City of New York	1855
Case, Mary W.	33	Rensselaer	New York State	Aug. 19, 1889.	Woman's Med. Coll., Phila.	1882
Chace, William (F)	58	Chautauqua	St. Catharine's, Canada	Dec. 27, 1891.	Coll. Phys. and Surg., N. Y.	1858

[1] (F) Founder. [2] (O) Original Fellow.

Church, Allen S. (F) . . .	62	New York .	Great Barrington, Mass. .	Oct. 24, 1884.	Castleton, Vt., ...	1848
Clark, Alonzo	80	New York .	Chester, Mass.	Sept. 13, 1887.	Coll. Phys. and Surg., N. Y.	1835
Clark, Simeon T. (O) . .	55	Niagara . .	Canton, Mass.	Dec. 24, 1891.	Berkshire Med. Coll. . .	1860
Coit, William N. (F) . . .	52	Clinton . . .	Plattsburgh, N. Y. . .	Aug. 4, 1886.	University of Pennsylvania	1856
Collins, Isaac G. (F) . . .	53	Westchester .	Granville, N. Y. . . .	Dec. 18, 1885.	Albany Medical College .	1858
Collins, Thomas B. (O) . .	61	Monroe . .	Mendon, N. Y.	Feb. 17, 1888.	Jefferson Med. Coll., Phila.	1851
Cooper, William S. (F) . .	70	Rensselaer .	Scotland	May 26, 1890.	Albany Medical College .	1860
Cornell, F. O. (O)	29	Montgomery .	Glenville, N. Y. . . .	Dec. 3, 1884.	Albany Medical College .	1880
Cotes, J. R.	54	Genesee . .	Batavia, N. Y.	March 20, 1884.	Med. Dep. Univ. Buffalo .	1852
Creamer, Joseph	63	Kings . . .	Halifax, Nova Scotia . .	Jan. 6, 1893.	Coll. Phys. and Surg., N. Y.	1850
Cruttenden, Albert G. . .	75	Ontario . .	Covington, N. Y. . . .	June 7, 1890.	Willoughby Univ., Ohio .	1840
Damainville, Lucien . . .	52	New York .	Erie, Pa.	Dec. 15, 1891.	Long Island Coll. Hosp. .	1860
Davidson, John (F) . . .	91	Queens . . .	New York City	Dec. 26, 1884.	Lic. N. Y. St. Med. Soc. .	1829
De La Mater, S. G. (F) . .	73	Schenectady .	Bethlehem, Alb. Co., N. Y.	June 23, 1888.	Albany Medical College .	1842
Du Bois, Abram (F) . . .	81	New York .	Red Hook, N. Y. . . .	Aug. 29, 1891.	Coll. Phys. and Surg., N. Y.	1835
Eager, William B. (O) . .	65	Orange . . .	Orange Co.	Jan. 18, 1890.	Coll. Phys. and Surg., N. Y.	1848
Earll, George W. (F) . .	53	Onondaga . .	Mottville, N. Y. . . .	July 8, 1890.	Buffalo Medical College .	1858
Edgerly, Edward F. (F) .	50	Essex . . .	Moriah, Essex Co. . . .	June 23, 1889.	Albany Medical College .	1864
Elder, Jennie S.	32	Onondaga . .	Syracuse, N. Y. . . .	Feb. 2, 1889.	Med. Dep. Syracuse Univ.	1878
Ferguson, James (O) . .	74	Warren . .	Kortwright, N. Y. . . .	Oct. 27, 1892.	Castleton, Vt.	1841
Fitch, William (F) . . .	70	Tompkins . .	Franklin, N. Y. . . .	Sept. 14, 1893.	Albany Medical College .	1846
Flint, Austin (F)	73	New York .	Petersham, Mass. . . .	March 13, 1886.	Harvard Medical College .	1833
Flood, Patrick Henry (O) .	72	Chemung . .	Pennsylvania	March 12, 1886.	Geneva Medical College .	1845
Fox, Eli	57	Herkimer . .	Columbia, N. Y. . . .	Oct. 13, 1890.	Med. Dep. Univ. City N. Y.	1855
Fuller, Winfield S. (O) . .	48	Monroe . .	Walworth, N. Y. . . .	Jan. 13, 1888.	Coll. Phys. and Surg., N. Y.	1861
Fuller, Robert	72	Schenectady .	Schenectady, N. Y. . .	May 9, 1894.	Albany Med. Coll. . . .	1875
Garrish, John P. (O) . .	76	New York .	New Brunswick, N. J. .	April 1, 1891.	Jefferson Med. Coll., Phila.	1836
Gay, Charles C. F. (F) . .	66	Erie	Pittsfield, Mass. . . .	March 27, 1886.	Berkshire Medical College	1846

DECEASED FELLOWS.—*Continued.*

Name.	Age.	County.	Place of Birth.	Date of Death.	Medical College.	Year of Graduation.
Goldthwaite, Henry	52	New York	Mobile, Ala.	Jan. 3, 1895.	Bellevue Hos. Med. Coll.	1876
Govan, William (F.)	65	Rockland	Barnet, Vt.	March 22, 1894.	New York Med. Coll.	1854
Gray, John Perdue (F)	61	Oneida	Half Moon, Pa.	Nov. 29, 1886.	University of Pennsylvania	1849
Gray, John W. (F)	53	Livingston	America	April 17, 1886.	University of New York	1856
Green, Caleb (F)	73	Cortland	La Fayette, N. Y.	May 10, 1893.	Geneva Medical College	1844
Griswold, Gaspar (O)	29	New York	New York City	March 4, 1886.	Bellevue Hosp. Med. Coll.	1878
Guernsey, Desault (F)	55	Dutchess	Wilton, N. Y.	Dec. 9, 1885.	Coll. Phys. and Surg., N. Y.	1850
Hall, H. C. (O)	41	Broome	America	June 1, 1887.	University of New York	1869
Hall, John E. (O)	38	Albany	New Marlboro', Mass.	Nov. 3, 1886.	Albany Medical College	1877
Hamilton, Frank H. (F)	73	New York	Wilmington, Vt.	Aug. 11, 1886.	University of Pennsylvania	1835
Higgins, Seabury M. (O)	67	Onondaga	Brewster, Mass.	Dec. 9, 1889.	University City of N. Y.	1848
Hinds, Frederic J. (O)	32	Washington	East Greenwich, N. Y.	April 26, 1887.	Bellevue Hosp. Med. Coll.	1876
Hogan, Michael K.	64	New York	County Clare, Ireland	Feb. 25, 1894.	Coll. Phys. and Surg., N. Y.	1858
Hollister, Edwin O. (O)	41	Ontario	Batavia, N. Y.	Oct. 8, 1887.	Bellevue Hosp. Med. Coll.	1874
Hubbard, George E.	86	New York	Natural Bridge, N. Y.	March 23, 1893.	Med. Dep. Univ. City, N. Y.	1883
Hubbard, Samuel T. (F.)	36	New York	Haddam, Conn.	June 1, 1894.	Coll. Phys. and Surg., N. Y.	1835
Hull, William H.	....	Rensselaer	Petersburgh, N. Y.	Dec. 1, 1894.	Albany Med. Coll.	1866
Hunt, James H. (O)	44	Orange	Centreville, Sullivan Co.	Dec. 20, 1892.	Bellevue Hosp. Med. Coll.	1872
Husted, N. C. (F)	66	Westchester	Round Hill, Conn.	Nov. 19, 1891.	University City of N. Y.	1850
Hutchison, Joseph C. (F)	60	Kings	Old Franklin, Mo.	July 17, 1887.	University of Pennsylvania	1848
Hyde, Frederick (F)	80	Cortland	Whitney Point, N. Y.	Oct. 15, 1887.	Fairfield Medical College	1836
Johnston, Francis U. (F)	66	Richmond	New York City	Nov. 20, 1892.	Coll. Phys. and Surg., N. Y.	1852

King, James E. (O)	66	Erie	Warren, Pa.	Jan. 21, 1888.	Buffalo Medical College 1848
Knapp, Edwin A. (O)	67	Onondaga	New York State	Dec. 7, 1890.	Geneva Med. Coll. 1851
Knapp, John H. (O)	67	Cortland	New Fairfield, Conn.	April 30, 1886.	Chenango Co. Med. Soc. 1843 Geneva Med. Coll. 1861
Lamb, Milton M.	68	Rensselaer	Verona, N. Y.	April 10, 1892.	Castleton, Vt. 1856
Lamont, John Campbell	47	Wayne	Edinburgh, Scotland	Dec. 13, 1887.	Med. Dep. Univ. City N. Y. 1862
Lauer, Eugene (O)	40	New York	Germany	Oct. 31, 1886.	Giessen and Marburg 1868
Lester, Sullivan W. (O)	40	Rensselaer	Niantic, Conn.	Jan. 5, 1890.	Med. Dep. Univ. City N. Y. 1881
Linsly, Jared (F)	84	New York	Northfield, Conn.	July 12, 1887.	Coll. Phys. and Surg., N. Y. 1829
Lyman, E. S. (O)	80	Chenango	Torrington, Conn.	Nov. 20, 1892.	Regents Univ. N. Y. 1870
Matthews, David	60	New York	Sullivan County	July 9, 1891.	Coll. Phys. and Surg., N. Y. 1860
Maury, Rutson	27	New York	North Carolina	May 5, 1892.	Bellevue Hosp. Med. Coll. 1887
McClellan, Christopher R.	73	Kings	Maryland	Jan. 13, 1887.	University of Maryland 1835
McEwen, Robert C. (F)	60	Saratoga	Bainbridge, N. Y.	Dec. 26, 1893.	Coll. Phys. and Surg., N. Y. 1856
McTammany, George H.	31	Rensselaer	Troy, N. Y.	April 12, 1891.	Albany Medical College 1884
McTammany, Wm. F. (O)	36	Rensselaer	Troy, N. Y.	July 21, 1888.	Bellevue Hosp. Med. Coll. 1880
Mitchell, Howard E. (F.)	49	Rensselaer	Hudson, N. Y.	Aug., 1894.	University of Maryland 1882
Moore, Joseph W. (F)	47	Albany	Troy, N. Y.	Sept. 9, 1886.	Castleton, Vt. 1859
Morrell, Isaac	79	Chemung	Cornish, Me.	Sept. 8, 1887.	Bowdoin Medical College 1832
Pask, William (O)	55	Erie	England	Aug. 24, 1884.	Med. Dep. Univ. Buffalo 1884
Peck, M. R. (O)	62	Warren	Sand Lake, N. Y.	April 4, 1884.	Albany Medical College 1851
Perry, Nathaniel M. (O)	77	Steuben	Troupsburg, N. Y.	April 3, 1894.	Geneva Med. Coll. 1845
Pollard, Abiathar	90	Essex	Bridgewater, Vt.	April 15, 1893.	Castleton, Vt. 1836
Pomeroy, Charles G. (F)	71	Wayne	New York	Dec. 14, 1887.	Ontario Co. Med. Soc. 1837 Jefferson Medical Coll. 1850
Pryer, W. Chardavoyne (F)	54	Westchester	New York City	Sept. 24, 1888.	Coll. Phys. and Surg., N. Y. 1862
Purdy, Isaac (O)	57	Sullivan	Walkill, N. Y.	Dec. 6, 1885.	Castleton, Vt. 1851
Reynolds, Rufus C. (F)	79	Monroe	Columbia, Herkimer Co.	Dec. 22, 1886.	Fairfield Med. Coll., N. Y. 1830

DECEASED FELLOWS.—*Concluded.*

Name.	Age.	County.	Place of Birth.	Date of Death.	Medical College.	Year of Graduation.
Rice, George	44	Saratoga	Mechanicsville, N. Y.	Jan. 12, 1894.	Albany Med. Coll.	1872
Ring, William (F)	63	Erie	United States	April 20, 1887.	University of Buffalo	1848
Robinson, Joseph W.	49	Steuben	Angelica, N. Y.	Jan. 4, 1887.	Buffalo Medical College	1862
Rochester, Thomas F. (F)	63	Erie	Rochester, N. Y.	May 24, 1887.	University of Pennsylvania	1848
Sabin, Robert Hall (F)	56	Albany	Saxton's River, Vt.	Dec. 4, 1888.	Albany Medical College	1856
Sayre, Lewis Hall (F)	38	New York	New York City	Jan. 2, 1890.	Bellevue Hosp. Med. Coll.	1876
Schoonmaker, E. J. (F)	65	Seneca	Ulster Co., N. Y.	Aug. 19, 1889.	Geneva Medical College	1848
Skiff, George V. (O)	53	New York	Pike, N. Y.	Jan. 28, 1890.	Univ. City of New York	1860
Slack, Henry (F)	57	Dutchess	Albany, N. Y.	Dec. 10, 1886.	Albany Medical College	1852
Slocum, J. O. (F)	65	Onondaga	Pompey, N. Y.	Mar. 3, 1885.	Castleton, Vt.	1846
Smith, David M.	35	Yates	New York City	Mar. 19, 1891.	Bellevue Hosp. Med. Coll.	1877
Smith, Joseph T. (F)	60	Ontario	Farmington, N. Y.	Dec. 9, 1890.	Jefferson Med. Coll., Phila.	1854
Smith, Marcellus R. (O)	74	Cortland	Taylor, N. Y.	Dec. 11, 1890.	Geneva Medical College	1847
Sprague, William B. (F)	55	Genesee	Pavilion, N. Y.	Mar. 16, 1891.	University of Buffalo	1857
Squire, Truman Hoffman	66	Chemung	Russia, Herkimer Co.	Nov. 27, 1889.	Coll. Phys. and Surg., N. Y.	1848
Steele, Charles G.	27	Erie	Buffalo, N. Y.	Feb. 12, 1888.	University of Buffalo	1886
Steinführer, Gustavus A. (F)	37	Schenectady	Germany	July 2, 1890.	Coll. Phys. and Surg., N. Y.	1874
Stevens, Frederick P. (O)	31	New York	Ithaca, N. Y.	Dec. 4, 1884.	Bellevue Hosp. Med. Coll.	1877
Stevenson, William G.	44	Rockland	Troy, Ohio	Feb. 3, 1888.	Bellevue Hosp. Med. Coll.	1864
Sutton, George Samuel	63	Dutchess	Louisville, N. Y.	Sept. 6, 1888.	Coll. Phys. and Surg., N. Y.	1859
Taylor, Isaac E. (F)	79	New York	Philadelphia, Pa.	Oct. 30, 1889.	University of Pennsylvania	1834
Van Dusen, Melville E.	36	Steuben	Wheeler, N. Y.	June 15, 1891.	Med. Dep. Univ. Mich.	1879

Vaughn, Frank O. (O) . .	44	Erie	Buffalo, N. Y.	Mar. 18, 1891.	Med. Dep. Buffalo Univ. .	1880
Webb, Edwin (O)	85	Queens . . .	Devonport, England . .	Jan. 29, 1890.	Coll. Phys. and Surg., N. Y.	1825
West, M. Calvin	58	Oneida . . .	Rome, N. Y.	Oct. 20, 1891.	Michigan University . . .	1860
White, Francis V. . . .	56	New York .	New York City	Oct. 9, 1889.	Univ. City of New York .	1855
White, William T. (F) . .	64	New York .	Richmond, Me.	Sept. 17, 1893.	New York Med. Coll. . .	1855
Willis, A. B.	43	Schenectady .	Coeymans, N. Y. . . .	May 10, 1891.	Albany Medical College .	1870
Winship, Cornelius A. (O)	62	Rensselaer .	Litchfield, Conn. . . .	Feb. 14, 1888.	Albany Medical College .	1858
Wood, Charles S. (F) . .	65	New York .	Litchfield, Conn. . . .	Feb. 1, 1890.	Jefferson Med. Coll., Phila.	1851
Woodend, William D. (F) .	61	Suffolk . . .	Portsmouth, Va. . . .	Mar. 8, 1893.	University of Pennsylvania	1855
Young, John (O)	71	Dutchess . .	Ireland	Sept. 2, 1893.	Coll. Phys. and Surg., N. Y.	1844
Young, Oscar H. (O) . .	43	Delaware . .	Pennsylvania	Jan. 21, 1889.	Jefferson Med. Coll. Phila.	1876

Total Deceased Fellows, 131.

INDEX.

Abdominal contusions, with report of twenty-one cases, Dr. T. H. Manley, 426.
Address of president, 20.
of welcome, Dr. C. E. Denison, 19.
the genesis of discovery, Dr. John Shrady, 395.
Anaesthesia with death, case of, Dr. Eden V. Delphey, 65.
Andrews, Judson Boardman, memoir of, 646.
Appendicitis, some interesting cases of, Dr. Joseph D. Bryant, 37.
Arthropathies of locomotor ataxia, Dr. Parker Syms, 524.
Atrophic rhinitis, use of stearate of zinc in, Dr. Joseph S. Gibb, 290.
Ayers, Douglas, fracture of inferior extremity of humerus, 282.
Biggs, Hermann M., discussion on prevention of tuberculosis, 314.
diphtheria, 360.
Branch, First, officers for 1895, 5; report of, 663.
Second, officers for 1895, 5; report of, 664.
Third, officers for 1895, 6; report of, 666.
Fourth, officers for 1895, 7; report of, 671.
Fifth, officers for 1895, 7; report of, 673.
Bryant, Joseph D., interesting cases of appendicitis, 37.
discussion on prevention of tuberculosis, 328.
Caesarian section, technique of, Dr. A. Palmer Dudley, 106.
Cellulitis, fatal suppurative, Dr. Wm. H. Robb, 300.
Church, Charles A., discussion on fatal suppurative cellulitis, 306.
typhoid fever, 502.
Colvin, Darwin, discussion on traumatic epilepsy, 33.
retinitis albuminurica in pregnancy, 391.
reminiscences of a country doctor, 403.
Committee of arrangements for 1893-'94, 2.
Council, annual report of, 691.
Cronyn, John, discussion on case of lithotomy, 32.
hysterectomy in pus cases, 136.
fractures of humerus, 289.
pleurisy, 378.
retinitis albuminurica in pregnancy, 392.
reminiscences of a country doctor, 424.
diphtheria, 355.
Delegates, list of, 17.
Delphey, Eden V., speculum for intra-uterine douching, 35.
case of anaesthesia with death, 65.
Denison, Charles E., address of welcome, 19.
Diet and regimen for diminution of fat, Dr. T. J. McGillicuddy, 308.
Diphtheria, Dr. John Cronyn, 355.
Diphtheria and pseudo-diphtheria, Dr. William H. Parks, 340.
Discussion on prevention of tuberculosis, 313.
Dr. Hermann M. Biggs, 314.
Dr. Lawrence Flick, 325.
Dr. J. H. Huddleston, 327.
Dr. Joseph D. Bryant, 328.
Dr. E. K. Dunham, 330.
Dr. William H. Parks, 332.
Dr. E. G. Janeway, 334.
Dr. J. G. Truax, 338.
Dudley, A. Palmer, technique of Caesarian section, 106.
Dunham, E. K., discussion on prevention of tuberculosis, 330

Ectopic pregnancy at utero-tubal junction, Dr. E. D. Ferguson, 533.
Epilepsy, report of case of traumatic, Dr. Zera J. Lusk, 29.
Fellows registered at 11th annual meeting, 13.
lists of, 699.
Ferguson, E. D., discussion on traumatic epilepsy, 32.
appendicitis, 48.
fatal suppurative cellulitis, 306.
retinitis albuminurica in pregnancy, 391.
ectopic pregnancy at utero-tubal junction, 533.
Fever, what is it, and how best managed? Dr. Henry F. Risch, 557.
Flick, Lawrence, discussion on prevention of tuberculosis, 325.
Fractures of inferior extremity of humerus, Dr. Douglas Ayers, 282.
Gibb, Joseph S., stearate of zinc compounds in atrophic rhinitis, 290.
Goodall, F. W., discussion on appendicitis, 46.
Govan, William, memoir of, 657.
Gouley, John W. S., typhlenteritis versus appendicitis, 78.
Granger, William D., memoir of Judson Boardman Andrews, M. D., 646.
Hannan, T. C., discussion on retinitis albuminurica in pregnancy, 393.
Hogan, M. K., memoir of, 654.
Hubbard, Dwight L., discussion on stearate of zinc compounds, 299.
Huddleston, J. H., discussion on prevention of tuberculosis, 327.
Hysterectomy, for uterine fibroma, by Baer's method, Dr. J. T. Johnson, 116.
Hysterectomy in pus cases, Dr. William R. Pryor, 123.
Inguinal hernia, surgical treatment of, Dr. Henry O. Marcy, 140.
Interesting cases from general practice, Dr. Chas. E. Lockwood, 50.
International sanitary laws, Dr. Stephen Smith, 84.
Intestinal anastomosis, with report of case, Dr. F. H. Wiggin, 503.
Intercranial lesions, differential diagnosis of, Dr. Chas. Phelps, 159.
Invited guests, 17.
Jamison, John C., memoir of Nathaniel M. Perry, M. D., 659.
Janeway, E. G., discussion on prevention of tuberculosis, 334.
Janvrin, J. E., discussion on hysterectomy in pus cases, 138.
early diagnosis of tubal pregnancy, etc., 537.
Johnson, Joseph Taber, hysterectomy for uterine fibroma, 116.
Kings County Medical Association, annual report of, 685.
Kittridge, C. M., memoir of John Young, M. D., 662.
Leale, Charles A., thoracentesis, with immediate restoration of function of lung, 544.
Leroy, Irving D., memoir of William Govan, M. D., 657.
List of presidents and vice-presidents, 8.
Fellows registered at the eleventh annual meeting, 13.
delegates and invited guests, 17.
Fellows by district and county, 699.
Fellows, alphabetically, 722.
retired Fellows, 740.
honorary Fellows, 741.
corresponding Fellows, 741.
deceased Fellows, 742.
Lithotomy, for removal of wire nail, Dr. Zera J. Lusk, 27.
Lockwood, Charles E., interesting cases from general practice, 50.
Lusk, Zera J., lithotomy, for removal of wire nail, 27.
case of traumatic epilepsy, 29.
discussion on fatal suppurative cellulitis, 307.
Manley, Thomas H., abdominal contusions, with report of twenty-one cases, 426.
Materia medica, pharmacy and therapeutics, Dr. E. H. Squibb, 577.
Marcy, Henry O., discussion on appendicitis, 47.
hysterectomy in pus cases, 135.
diphtheria, 362.
pleurisy, 377.
surgical treatment of inguinal hernia, 140.

Memoirs,—
JUDSON BOARDMAN ANDREWS, M. D., 646.
M. K. HOGAN, M. D., 654.
WILLIAM GOVAN, M. D., 657.
NATHANIEL M. PERRY, M. D., 659.
WILLIAM THOMAS WHITE, M. D., 660.
JOHN YOUNG, M. D., 662.
McGILLICUDDY, T. J., diet and regimen for diminution of fat, 308.
New York County Medical Association, annual report of, 682.
Officers and council for 1893–'94, 1.
1894–'95, 3.
Officers of the branch associations for 1895, 5.
O'MEAGHER, WILLIAM, memoir of M. K. HOGAN, M. D., 654.
PARKS, WILLIAM H., discussion on prevention of tuberculosis, 332.
communicability and treatment of diphtheria and pseudo-diphtheria, 340.
PERRY, NATHANIEL M., memoir of, 659.
PHELPS, CHARLES, discussion on typhlenteritis versus appendicitis, 83.
differential diagnosis of traumatic intracranial lesions, 159.
Pleurisy, diagnosis and treatment of, Dr. J. BLAKE WHITE, 364.
Presidents and vice-presidents, list of, 8.
Proceedings of eleventh annual meeting, 686.
PRYOR, WILLIAM R., hysterectomy in pus cases, 123.
Reminiscences of a country doctor, Dr. DARWIN COLVIN, 403.
Report of committee of arrangements, 19.
Retinitis albuminurica in pregnancy, Dr. FRANK VAN VLEET, 380.
RISCH, HENRY F., what is fever, and how best managed? 557.
ROBB, WILLIAM H., fatal suppurative cellulitis following injury to hand, 300.
Sanitary laws, necessity of international, Dr. STEPHEN SMITH, 84.
SHRADY, JOHN, address: the genesis of discovery, 395.
memoir of WILLIAM THOMAS WHITE, M. D., 660.
SMITH, J. LEWIS, tetanus neonatorum, 566.
SMITH, STEPHEN, necessity of international sanitary laws, 84.
Speculum, for use in intra-uterine douching, Dr. EDEN V. DELPHEY, 35.
SQUIBB, E. H., materia medica, pharmacy, and therapeutics, 577.
Stearate of zinc compounds in atrophic rhinitis, Dr. JOSEPH S. GIBB, 290.
STRONG, THOMAS D., president's address, 21.
SULLIVAN, J. D., discussion on fatal suppurative cellulitis, 305.
SYMS, PARKER, arthropathies of locomotor ataxia, 524.
Tetanus neonatorum, Dr. J. LEWIS SMITH, 566.
Thoracentesis, with immediate restoration of function of lung, Dr. CHAS. A. LEALE, 544.
TOWNSEND, M. W., discussion on traumatic epilepsy, 32.
TRUAX, J. G., discussion on appendicitis, 46.
prevention of tuberculosis, 338.
pleurisy, 377.
remarks on treatment of typhoid fever, 497.
Tubal pregnancy, early diagnosis of, Dr. J. E. JANVRIN, 537.
Tuberculosis discussion on prevention of; see discussion, 313.
Typhlenteritis versus appendicitis, Dr. JOHN W. S. GOULEY, 78.
Typhoid fever, remarks on treatment of, Dr. J. G. TRUAX, 497.
Uretero-intestinal fistula, with recovery, Dr. A. T. VAN VRANKEN, 553.
VAN VLEET, FRANK, treatment of retinitis albuminurica in pregnancy, 380.
VAN VRANKEN, A. T., discussion on fractures of humerus, 289.
uretero-intestinal fistula, with recovery, 553.
WHITE, J. BLAKE, diagnosis and treatment of pleurisy, 364.
WHITE, WILLIAM THOMAS, memoir of, 660.
YOUNG, JOHN, memoir of, 662.

WELLCOME LIBRARY INSTITUTE